



BUSINESS TECHNOLOGY LEADERSHIP

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Policies, technologies for wireless LANs that let you rest easy

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THE TRUTH ABOUT SOA

FORGET THE HYPE.

Service-oriented architecture is not for everybody. Here's how to tell if it's for you. And also, how to get started.

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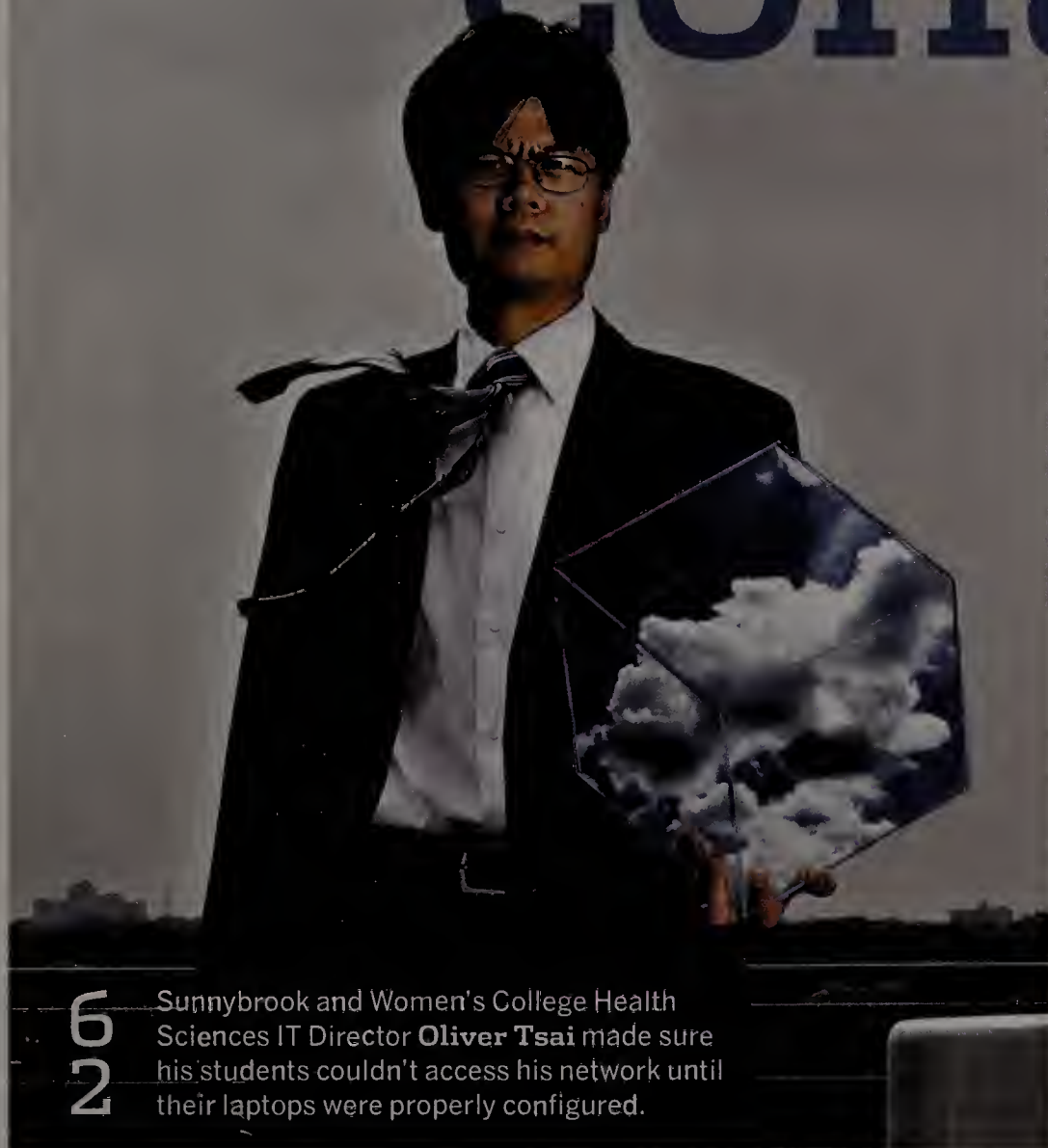
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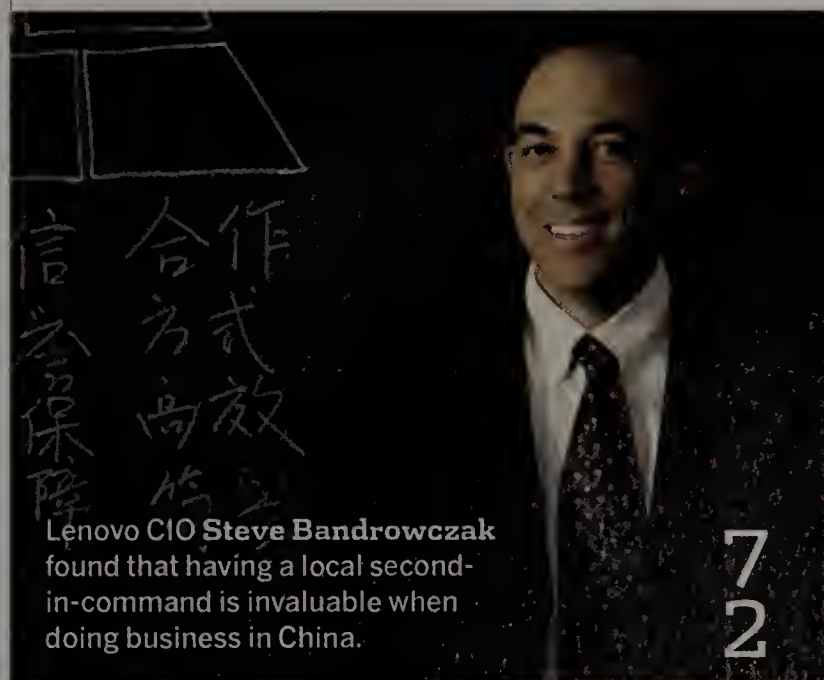
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[THE LATEST SPECIAL REPORT]

The ABCs of SOA

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EYE ON THE FUTURE

Lou Mazzucchelli, fellow at the Cutter Business Technology Council, tells *CIO* how IT history repeats itself, and which emerging technologies CIOs should have on their radar. Also hear excerpts from his presentation at this spring's Cutter Consortium Summit.

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[IN THE NEWS]

GOVERNMENT SURVEILLANCE

It was first reported that BellSouth, Verizon and AT&T turned over customer records to the National Security Agency while Qwest refused. Now BellSouth and Verizon are denying the charges, and AT&T may be next. But what would you do if the feds came knocking, telling you it's your patriotic duty to hand over your customers' personal data? Read our stories and join the conversation. www.cio.com/specialreports/surveillance.html

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Lessons in Leadership

There were lots of great takeaways from the recent CIO Leadership Conference. Here are my top 10.

It's wet. We're into the seventh day of the great New England downpour of 2006. There's well over a foot of rain flooding roads and fields and basements. Rain makes me reflective, and today I'm looking back on last month's CIO Leadership Conference.

The conference was a mix of inspiration, great networking and practical advice. We opened with a talk by author and historian David McCullough, closed with a practicum from Harvard professor Joseph Badaracco on how to handle ethical dilemmas, and in between there were terrific sessions with Harvard icon Warren McFarlan, Royal Caribbean CIO Tom Murphy and loads of other accomplished practitioners.

Thinking back on what I heard, a few things stand out. Here are my top 10:

10. "Failure is not an option" (once uttered by Apollo 13 project leader Gene Krantz). This, according to McCullough, was one of George Washington's defining traits. No matter what mistakes he made, he didn't let his disappointment in himself discourage him. Thinking about Washington in those terrible days of 1776 gave me a whole new perspective on the word dis-courage.

"The true test of a leader is how you behave when the chips are down and things are ambiguous—including when no one's watching."

—David McCullough

9. The kind of organization you're in determines what kind of leader you need to be. McFarlan's example of the challenges (successfully) faced both by Pete Solvik,

CIO at Cisco when the company was in hypergrowth mode, and Brad Boston, Cisco's CIO since 2002, was a great illustration of how different business conditions require different skills. It also highlighted the futility of defining a single ideal CIO profile.

8. A good leader has integrity. That means being accountable, truthful, a team player and tough when you need to be. World Wildlife Fund CIO Greg Smith led an interactive discussion on what it takes to be an effective CIO.

7. Don't be lazy. Tom Murphy said that leaders must push beyond their natural abilities (of charm or humor or fortitude) if they really want to make a difference.

6. Make sure that everyone in your organization can articulate what it is you're trying to accomplish. Tyrone Howard, who runs the program management office for the City of Chandler, Ariz., spoke of the power of effectively communicating your strategy and goals throughout the organization.

5. The true test of a leader is how you behave when the chips are down and things are ambiguous—including when no one's watching. —McCullough

4. Your team is allowed to have morale problems; leaders are not. —McCullough

3. Leaders require a sense of history—not just so they can learn from the past but so they will understand that what they do matters in the long run. —McCullough

2. When faced with ethical dilemmas, apply three tests to your decision, said Badaracco: The Newspaper Test (How would you feel if you saw it as a headline in tomorrow's paper?); The Golden Rule (How would you feel if it was done to you?); and The Obituary, or Best Friend, Test (How do you want to be remembered?)

1. Listen. McFarlan, McCullough and others agreed that listening well is one of the most essential leadership skills of all.

A handwritten signature in black ink that reads "Abbie Lundberg". The signature is fluid and cursive, with a long, sweeping underline.

Abbie Lundberg, Editor in Chief
lundberg@cio.com

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IT Finds a Heart

The best kind of competition: vying to bridge the digital divide



For many reasons—an improving economy, avian flu anxiety, the war in Iraq—the issue of the digital divide has, unfortunately, been placed on the back burner. But that doesn't mean it has gone away. The numbers speak for themselves.

According to a presentation given by Intel President and CEO Paul Otellini, of the 15 percent of the world's population that has access to the Internet, less than 5 percent have broadband. Of the fortunate 800 million people in the world who earn more than

\$25,000 a year, 70 percent have PCs. But of the 4.7 billion people who earn between \$1,000 and \$25,000 annually, only 10 percent have PCs. And of the 1 billion who earn less than \$1,000 a year, almost none have a computer.

That's why it is so refreshing (not to mention surprising) to find that two rivals, AMD and Intel, are now competing to address this issue, each in its own way.

AMD's 50x15 initiative is intended to build alliances to enable affordable Internet access and computing capability for 50 percent of the world's population by the year 2015 (<http://50x15.amd.com/en-us>). In tandem with this announcement, AMD has launched the Personal Internet Connection, or PIC, which the company describes as "a new category of affordable consumer devices designed to provide managed Internet access...to enhance communications, entertainment and education opportunities."

Not to be outdone, Intel has launched its own initiative, the World Ahead Program (www.intel.com/intel/worldahead). Its five-year goals are to extend wireless broadband PC access to the world's next billion users while training 10 million more teachers on the effective use of technology in education, with the possibility of reaching another 1 billion students. Intel has committed \$1 billion to this program over the next five years.

I don't know if this is an exercise in one-upmanship between AMD and Intel. Truthfully, who cares? The bottom line is that hopefully, in the near future, a greater percentage of the world's population will be able to have its voice heard. And that's a good thing. Because if this issue is not resolved, and soon, the consequences will be devastating for people and nations on both sides of the divide.

That is why it was so welcome to hear AMD CEO Hector Ruiz say at the World Congress IT 2006 that, "IT has a brain. Now it's time to show it has a heart." Those are sentiments that should be shared—and put into practice—by the whole IT community.

Michael Friedenber, President and CEO
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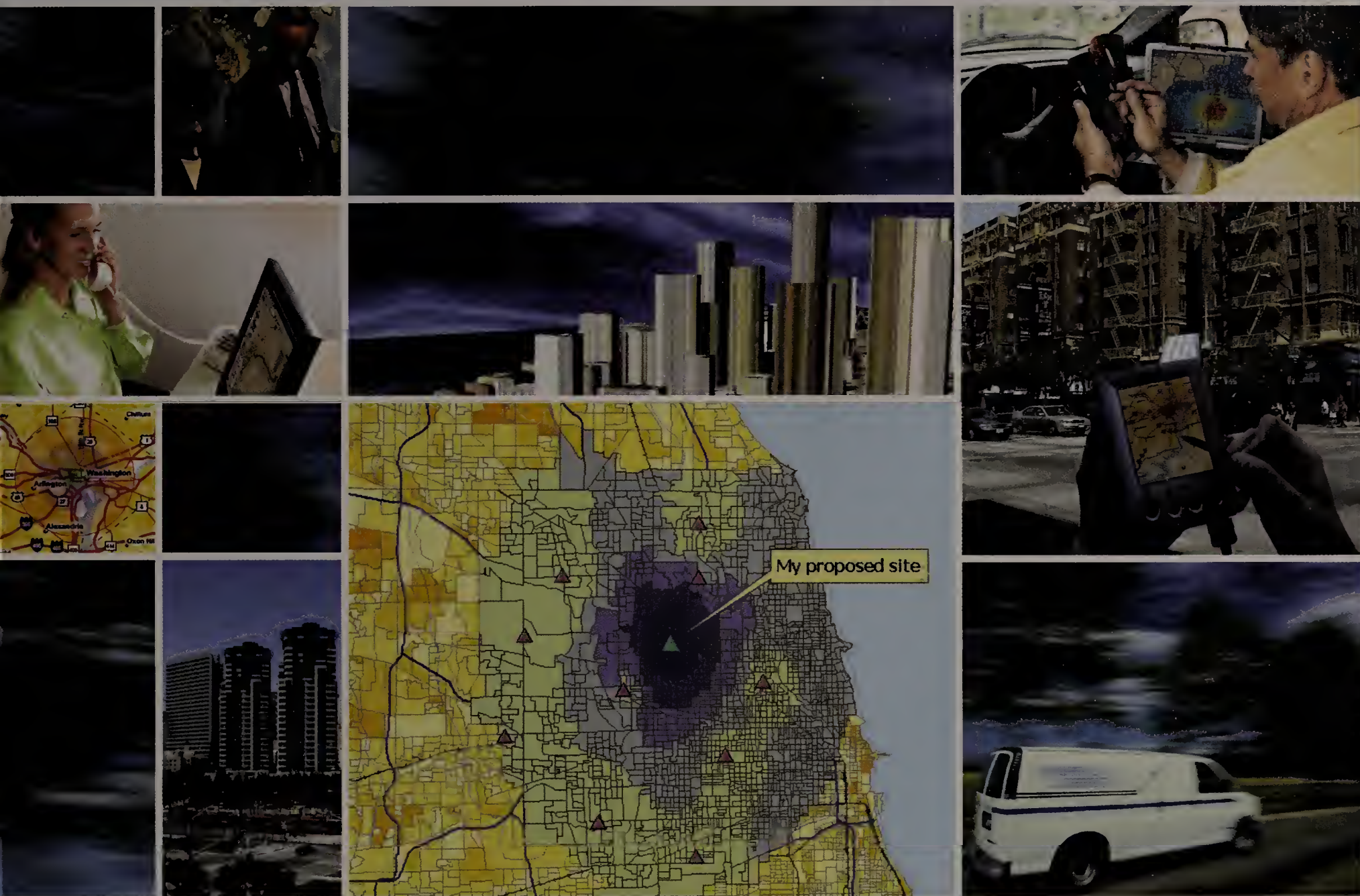
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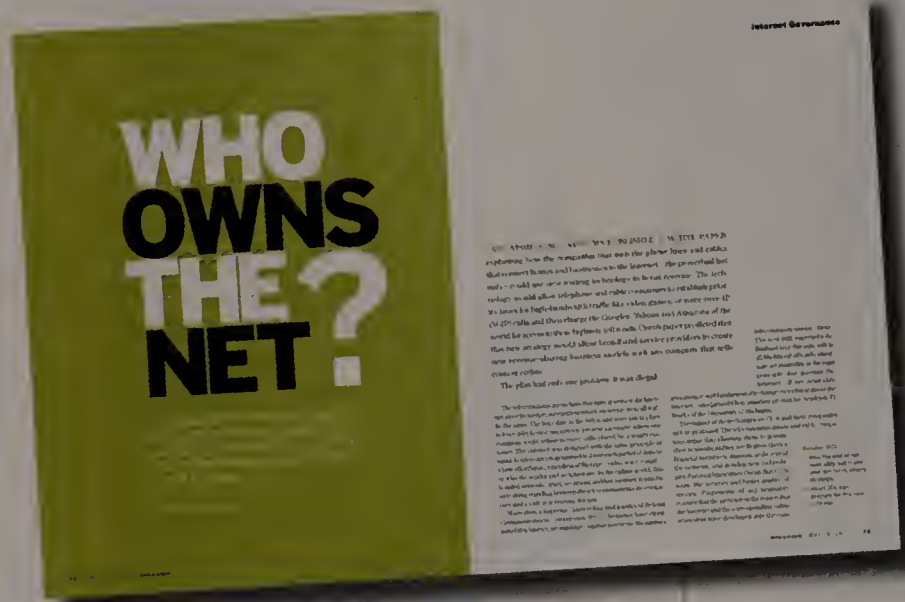
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InBox



Neutrality According to...?

Your article ["Who Owns the Net?" May 1] almost totally ignores more than a decade of lessons surrounding federal restraint and the Internet's success in an effort to support federal "neutrality" regulations.

Once you try to define what will be regulated, unintended consequences will surely result. If broadband providers are made liable in court for the way their pipes carry digitized information, you're going to have Congress and FCC regulators writing rules that cover the basics of Internet traffic.

Do we really think the Internet will benefit from having government officials write rules on caching, colocation, packet prioritization and reassembly, and the like? And when these rules are challenged in court (meaning more delays), will that help or hurt efforts to improve the U.S. broadband deployment?

Trying to guess at a regulated formula for network neutrality that would protect the public interest and not impede innovation is on par with picking a perfect NCAA basketball bracket.

There's another aspect of net neutrality that's even more problematic: the way it mixes two separate entities, namely the public Internet and private networks. For 20 years, private networks have been helping business, government, universities and others that need specialized communi-

cation. There's nothing wrong with groups that are willing to pay a little extra because they need a specialized service—think of UPS versus the Postal Service.

So if net neutrality regulations are passed, would federal regulators have to write separate rules for public versus private networks? Would there be different federal rules for low-bandwidth IP services that use the public Internet and high-bandwidth services that don't?

Entire forests will be sacrificed to produce all the legal and technical filings that would surround these and other neutrality questions. In my view, we're far better off continuing on the sound path the Clinton administration established and letting the technology continue to evolve unfettered.

MIKE McCURRY
Cochair, Hands Off the Internet Coalition
www.handsoff.org

Paying for a higher level of service was a matter of time. This reality does not bother me. The knowledge that there will be problems between carriers absolutely does. This happens all the time now with BGP peering (the routing protocol that runs the Internet)—one carrier will block routes from another carrier, not allowing it to cross its boundaries unless some type of agreement is made.

So, if you have customers originating from the blocked carrier, this could mean poor response or a fully blocked path to your services, resulting in lost sales. If one of your partners is blocked, you lose productivity. Either way, you'll lose revenue while paying higher connectivity costs!

The worst part is that the service-level agreement your provider will give you will absolutely state this service applies only to its network, not any other provider's. Anybody who does business that crosses those lines will feel the pain without any recourse available.

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More on Toxic Leaders

With regards to confronting a toxic leader, ["Toxic!" April 15] I would do so only if he worked for me. Toxic leaders aren't likely to listen to anything anyone "below" them would have to say. If the environment doesn't fit with your values, then it's time to move on before you wake up one morning hating yourself.

JACK BROOKS
IT Manager, iStark Inc.

I have reported to, supervised, coached and sometimes terminated toxic leaders at various levels in a variety of organizations. Frequently these toxic leaders were a hiring mistake; I can understand that they sometimes get through recruiting checkpoints. However, the bigger issue is those in senior management who allow toxic individuals to continue in their roles rather than address their counterproductive behavior effectively.

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EDITED BY ELANA VARON

NEW * HOT * UNEXPECTED

Tech that Fuels Ethanol Production

ENERGY Ethanol isn't new. Henry Ford originally designed the Model T to run on the corn-based fuel, which currently accounts for roughly 3 percent of the nation's fuel consumption. Researchers at the University of California, Berkeley, say, however, that ethanol could replace 20 percent to 30 percent of fuel usage in the United States in just a few years—in part through cars converted to burn a mixture of ethanol and gas.

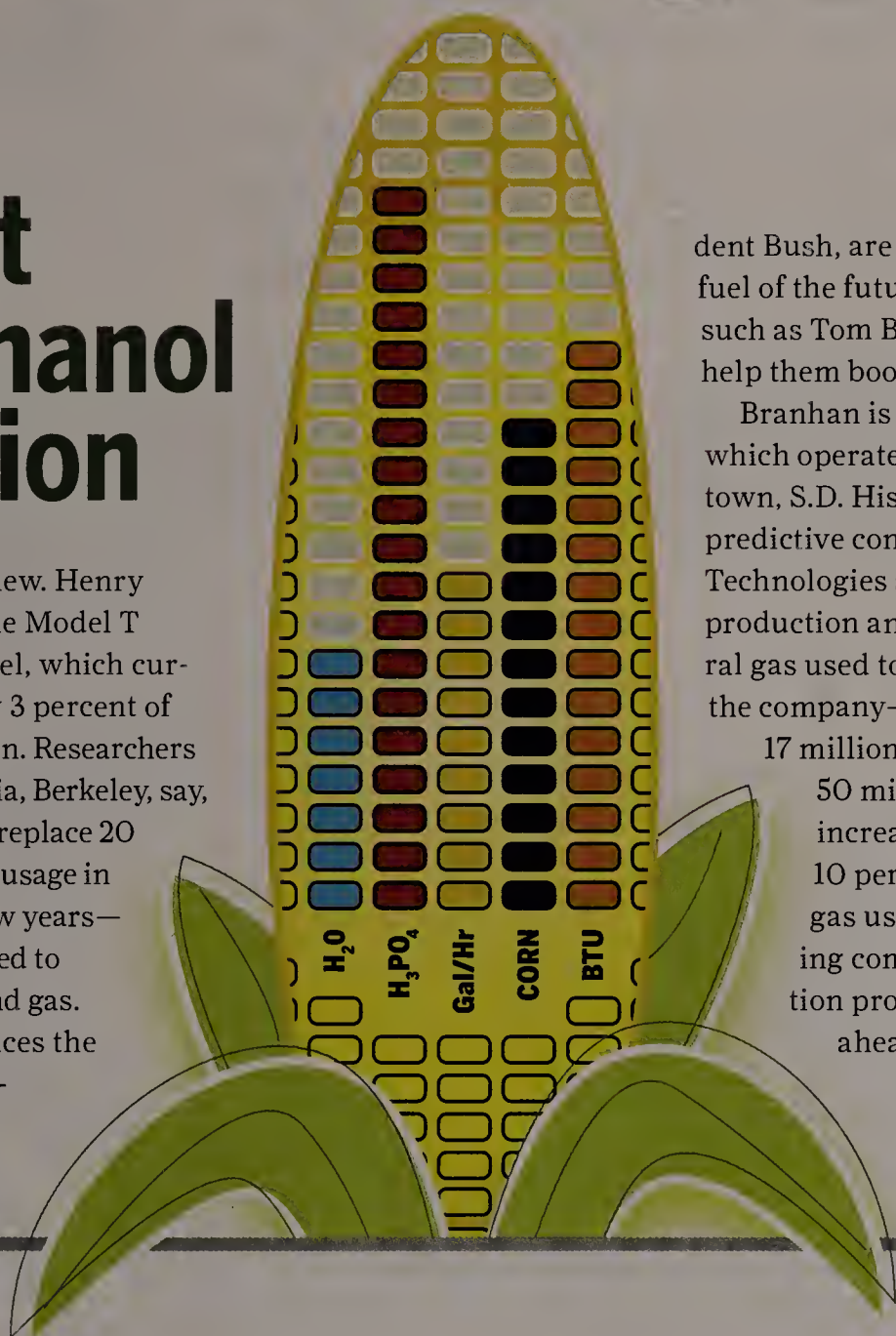
And so, as the country faces the dual dilemmas of oil dependence and global warming, leaders, including Presi-

dent Bush, are touting ethanol as a possible fuel of the future—and ethanol producers such as Tom Branhan are turning to IT to help them boost production.

Branhan is CEO of Glacial Lakes Energy, which operates an ethanol plant in Watertown, S.D. His company started using predictive control software from Pavilion Technologies about a year ago to help boost production and reduce the amount of natural gas used to run the plant. Since then, the company—which converts more than 17 million bushels of corn per year into 50 million gallons of ethanol—has increased production by as much as 10 percent while cutting its natural gas usage by up to 3 percent. "Adding computer control to our production process has allowed us to stay ahead of the curve," Branhan says.

Even though the basic technique used to make the

Continued on Page 20



Your Web, My Web, Our Web

INTERNET The Internet's impact on users' lives has grown during the past five years, but that impact is greater in some areas than in others, according to a recent survey by the Pew Internet & American Life Project.

According to the survey, 35 percent of Internet users said being online has greatly improved their ability to do their jobs, up from 24 percent in March 2001. The job category saw a lower growth rate than other areas.

In the category of respondents'

personal lives, the growth rate was higher. For example, 33 percent reported that being online has greatly improved the way they pursue their hobbies and interests, up from 20 percent five years ago.

The resources and services available on the Web have exploded since 2001, but at the same time it's become harder to make an impression on users, says Mary Madden, a research specialist at Pew. Also, occasional users may not know about things on the Internet that could change

the way they live, Madden adds. Daily users are much more likely to report that being online has a major impact on the way they do things.

Internet use is still more common among wealthier people, but the gap is narrowing, Madden says.

"Much of the growth that has occurred in the past year alone has come from low-income groups," she says.

—Stephen Lawson



Iraq's Virtual Library

RESEARCH A group of U.S. scientists, with help from Sun Microsystems and the U.S. government, have launched an online library containing more than 1 million research articles for Iraqi scientists and students.

The Iraqi Virtual Science Library (IVSL) was started with \$362,000 from the U.S. Department of State and the U.S. Department of Defense. According to project organizers, the online library is needed because for more than 20 years, Saddam Hussein's regime neglected libraries and the scientific community. Then, following the U.S. invasion of Iraq in 2003, many Iraqi libraries were found to have been looted and destroyed.

"The Iraqis began with nothing," says Barret Ripin, senior science diplomacy officer for the U.S. Department of State. "A lot of the holdings that they did have were destroyed in the aftermath of the war."

The project started with a group of scientists who were working at the State Department or DoD through a fellowship program of the American Association for the Advancement of Science. The group wanted to give Iraqi scientists and students access to "top-tier" research, says D.J. Patil, an IVSL cofounder and researcher at the University of Maryland.

With the first phase of IVSL complete, the online library includes access to more than 17,000 research journals. Some publishers donated access, while others offered subscription discounts, says Susan Cumberledge, another IVSL cofounder and a professor of biochemistry and molecular biology at the University of Massachusetts. Iraqi scientists and students can sign up for access through seven universities and one research institute there, and more schools will be added, Cumberledge says.

Sun helped the IVSL team evaluate the Internet connectivity and infrastructure needed for the project. In the next phase, Sun will help Iraqi universities and government agencies create an open-source Web portal that the universities can manage, company officials say.

—Grant Gross



Ethanol

Continued from Page 19

fuel—distilling corn to make alcohol—hasn't changed much in a century, the process of producing high-grade ethanol can be tricky, Branhan points out. The corn is ground up and cooked, and the resulting starch is mixed with water to form a mash. By adding yeast, the mash is fermented and then pumped into a distillation system where the manufacturing process is completed. Throughout the process, producers need to monitor moisture levels, air flow and other variables such as the flow of natural gas that powers the plant's machinery.

By using control technology, ethanol producers can more effectively monitor these variables and make data visible to plant operators, Branhan says. For example, the computerized system allows Glacial Lakes' plant operators to more closely analyze the amount of water in the ethanol. They can then take steps to maximize the water content in the fuel, enabling greater production.

Predictive control technology was first used in oil refineries in the 1970s and is now used in petrochemical plants as well as power plants and paper mills. Tom Fiske, a senior analyst at ARC Advisory Group, says that by building control technology into plans for new ethanol plants, producers can be sure that they will be operating efficiently.

"The ethanol industry is still young," observes David Culver, director of operations at Glacial Lakes. And greater automation, Culver adds, will help this industry face growing demand for its product.

—Susannah Patton

WHAT'S SCARIER INCOMPETENCE OR TERRORISM?

SECURITY

Ninety-one percent of companies worry that their systems or data will be stolen, misused or damaged by an outsourcing provider, while only 48 percent fear that outsourcers will be threatened by terrorism, according to a survey of 158 executives by consultancy Booz Allen Hamilton.

Among the study's other findings:

85%

are willing to pay a premium for improved security.

76%

say security risks are higher with offshore than with U.S.-based service providers.

67%

support some type of federal security and privacy standards for outsourcers.

64%

consider viruses, spyware and other data security threats to be top concerns when managing or evaluating outsourcing relationships.

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RFID Rules

PRIVACY Companies using radio frequency identification (RFID) tags on products should always tell their customers and make sure they know whether they can deactivate the tags, according to a set of best practices for RFID deployment proposed by a group of IT vendors, RFID users and consumer advocates.

"There should be no secret RFID tags or readers," according to a draft report by the Center for Democracy and Technology (CDT) Working Group on RFID. Members of the group include Cisco, IBM, Intel, the National Consumers League, Procter & Gamble and VeriSign.

The report adds that, by itself, consumer notification does not mitigate all privacy concerns. Companies collecting personally identifying information through RFID tags should tell customers how that data will be used. And if customers can opt out of sharing that information, or can destroy the tags, those options must be readily available, the report says.

"The document draws from widely accepted and traditional principles of fair information practices," says Paula Bruening, staff counsel at CDT, a privacy and civil liberties advocacy group. It offers concrete guidance for companies that want to deploy RFID in a way that respects privacy, but also recognizes the need for technological flexibility, she adds.

The expanding use of RFID, embraced by large retailers such as Wal-Mart and Target, has raised concerns about privacy. Because scanners can read RFID chips from a short distance, privacy advocates worry that the technology could eventually be used to track people's movements and purchases.

—Grant Gross

washingtonwatch

EDITED BY ALLAN HOLMES

When East Meets West on IP Rights

When Chinese President Hu Jintao met with President Bush in April, he assured Bush that China, long known as a nation that does not respect intellectual property rights, was taking steps to protect the IP of U.S. companies. But the reality is that not much may happen for years due to the fragmented Chinese business culture.

"We talk of China as though it is one monolithic entity," says Steven Henry, a lawyer at Wolf Greenfield and Sacks. "It may be centrally governed, but when it comes to IP enforcement, it is not one country."

China's government, companies and citizens all benefit from an economy that ignores intellectual property rights. Small businesses that specialize in counterfeit goods operate in the open. The Beijing government could shut them down, but it doesn't

because the black market creates jobs and

allows people to buy products such as movies that they otherwise could not afford.

Meanwhile, many Chinese companies ignore IP to avoid paying hefty royalties to Western companies, says Henry. In response, the Beijing government is encouraging development of domestic standards, such as TD-SCDMA, a wireless standard, and AVS, a video-compression rival to .mpeg. Gao Wen, chairman of the audio-video coding standard working group in China, says that China will charge companies that use its standards up to 20 times less than what IP owners in the West charge.

Henry says that it may take a generation or more before China abides by Western IP rules because that's how long it will take Chinese companies to develop a critical mass of IP of their own so that protecting it will be in their financial interest. If your company cannot wait that long to jump into the Chinese market, but you still are concerned about how your company might protect its IP, you may want to emulate what Warner Brothers did. Last fall, the media company created a partnership with the state-owned China Film Group and the privately run Hengdian Group to develop Chinese-language films. According to some Beijing DVD shoppers, it is now harder to find movies produced by Warner Brothers on the black market.

Henry says this example illustrates the importance of building relationships with Chinese partners and understanding "what their motives are and what their ethics are." For now, he concludes, "the relationship may be more important than the law."

—Ben Worthen



President Bush and China's President Hu Jintao conferred on IP rights in April.

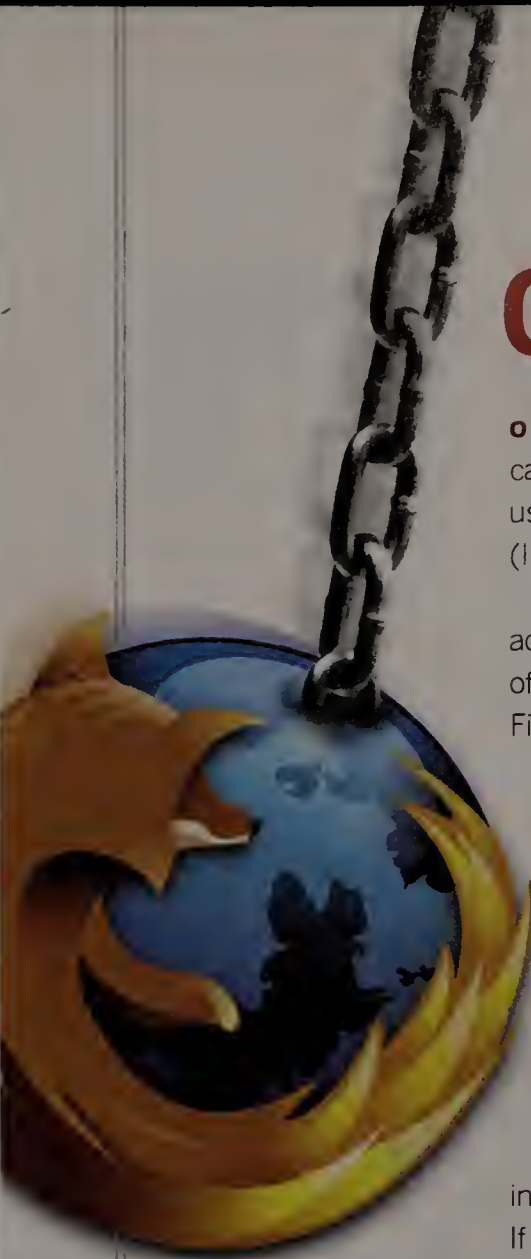
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Outfoxing Bill Gates

OPEN SOURCE A group of self-styled “political activists” has started campaigning for browser users to switch from Microsoft Internet Explorer (IE) to Mozilla Firefox.

The campaign, called Explorer Destroyer, takes advantage of a new program by Google to pay users of its AdSense service a dollar for each referral to Firefox made through Google Toolbar, according to the group’s website (www.explorerdestroyer.com).

AdSense enables Web publishers to earn money by displaying ads on their websites that are served by Google.

Explorer Destroyer exhorts visitors: “You already want people to switch to Firefox. Now’s the time to get serious about it.” According to Mozilla, Firefox accounts for 10 percent of the browsers in use in the United States.

Explorer Destroyer offers website owners scripting technology that will detect if a visitor is running IE. If so, an alert will appear directing the visitor to download Firefox in order to either view the site better or see it at all. If the visitor downloads Firefox, the

owners of the referring website will get the referral fee if they have signed up for Google AdSense.

There are three types of alerts site owners can put on their page: “gentle encouragement,” “semiserious” or “dead serious.”

If a website owner chooses “gentle encouragement,” visitors who are using IE will see a banner across the top of the page that encourages them to download Firefox. A “semiserious” site will put up a splash page with a link for downloading Mozilla’s browser. Those who choose the “dead serious” rating block users with IE from viewing their pages unless the users install Firefox.

The group also has launched a tongue-in-cheek website (www.killbillsbrowser.com) that parodies IE and provides reasons (many of them off-color) why users should switch to Firefox. Among them: “It will make Bill Gates soooooooooo mad.” The site also refers to the difficulties users sometimes encounter when using IE and problems developers have making websites IE compatible.

—Elizabeth Montalbano

Why Technology Fails

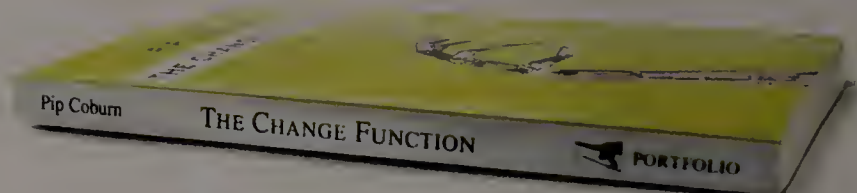
A skeptical view of new technology

BOOK REVIEW Most business books have one big idea that the author draws out for 200 pages. Usually the idea can be explained in a review, and the book itself, colored with vague examples, is best to skim.

Pip Coburn’s *The Change Function: Why Some Technologies Take Off and Others Crash and Burn* is different. Yes, he has a big idea—that you can predict which technologies will succeed or fail by applying a simple formula—and this idea is covered in the first 10 pages. (And yes, you’ll understand the idea by the end of this review.) But what sets this book apart from so many others is that the rest of it is worth reading. Coburn fills his book with detailed case studies, gleaned from his years as managing

director of the technology group at UBS Investment Research, that illustrate his formula. And thanks to the detail, the cases actually teach you something.

The core of Coburn’s formula is that a new technology should be widely adopted only if it meets two criteria. First, it has to address a problem, and second, that problem has to be more painful than the perceived pain of adopting the new technology. “We need to balance our wonderment at technology’s role in creating nirvana with a skepticism about business models,” writes Coburn, now head of his own investment company, Coburn Ventures. The picture-phone, for example, which AT&T pushed from the 1960s to the 1980s, failed because the need to see the



The Change Function: Why Some Technologies Take Off and Others Crash and Burn

By Pip Coburn
Portfolio, 2006, \$24.95

person you’re talking to isn’t a big enough problem to justify buying and learning how to use an expensive new phone system.

That’s a lesson that should hit home for CIOs. Applying Coburn’s insight, CIOs should force IT projects through a gauntlet of questions, asking not only if a particular technology will solve a problem but also whether that problem is one users are desperate enough to have them do something about.

—Ben Worthen

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Randy Spratt, CIO



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by the numbers

BY DIANN DANIEL

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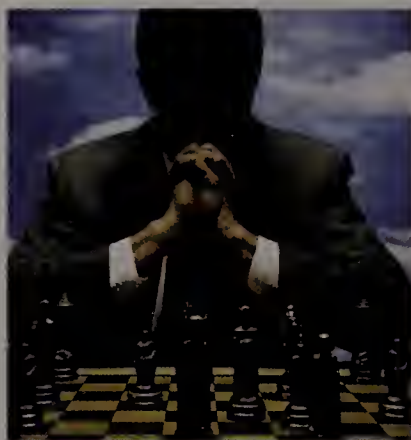
Room to Improve IT's Moves

At smaller companies, IT is best at meeting tactical goals

I.T. DECISION-MAKERS

at small and mid-market companies think the IT shop is best at supporting tactical efforts such as improving efficiency, but they reported that IT falls short when it comes to innovation and other strategic contributions, according to a survey by Forrester Research.

But there's room for improvement even in areas that executives think IT is good at. For example, only 38 percent of the 540 executives surveyed think that IT is great at improving workforce productivity. More respondents—46 percent—said this is something IT is only somewhat good at. Similarly, only 34 percent



said their IT departments were great at lowering company operating costs.

Even fewer execs think IT is great at making strategic contributions. A mere 21 percent said that IT excels at revamping core business processes.

The decision-makers surveyed included both IT

executives and business leaders such as CEOs and CFOs. Michael Speyer, the Forrester senior analyst who led the study, notes that the IT execs gave themselves better marks at cost-cutting and improving productivity than non-IT execs gave IT. Speyer says the ratings are based on respondents' perceptions of IT, and he thinks the differences of opinion suggest the need for a common language shared by IT and the rest of the business when evaluating IT's performance.

As for why IT isn't better at contributing to strategic efforts, Speyer points out that IT has had 20 years of practice supporting such areas as improving efficiency, but only in some companies has IT been asked to contribute to core business transformation. For example, in retail, enabling employees to go online to find the location of an out-of-stock item or allowing customers to order on the Web and pick up the item in a store are business

innovations that aren't possible without IT. But in general, Speyer says, IT execs have not been called upon to help brainstorm new business models, and so supporting innovation can be outside the comfort zone of many IT shops.

Best Practices:

1] Create shared metrics. Speyer says objective measurements that both IT execs and non-IT execs can use to discuss how well IT is doing can help close gaps in how IT's performance is perceived.

2] Make more time. Create opportunities to work on strategic initiatives by streamlining IT operations. For example, consolidating servers using automated data center management tools makes data center management easier and frees up IT staff for other activities—like learning about the business.

3] Speak the CEO's language. IT must figure out how to translate business goals into IT goals. To do so, the CIO must learn the language of the business and understand its processes. Compared with their counterparts in large companies, CIOs at smaller companies may find it easier to get close to the action.

What IT Organizations Do Best

Technology decision-makers rate how well IT supports business objectives

How much IT contributes

GOAL	A LITTLE/ NOT AT ALL	SOMEWHAT	TO A GREAT EXTENT
Improving productivity	17%	46%	38%
Improving products or processes	23%	39%	38%
Lowering costs	27%	38%	34%
Managing customer relationships	31%	36%	34%
Acquiring and retaining customers	35%	33%	32%
Driving innovative new products, services or business practices	39%	36%	25%
Reengineering core business processes	41%	38%	21%

Note: Percentages may not total 100 due to rounding.



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Those Incredible Shrinking Servers

BY CHRISTOPHER LINDQUIST

DATA CENTERS | You may be installing virtualization tools so that one server can do the job of five. You might be using configuration management tools to swap applications from one machine to another, depending on load. You may simply be looking to retire old hardware in order to run apps on new, more energy-efficient multicore systems. But no matter what your strategy, your goals or your tactics, you still have a problem. How the heck do you even know what's out there to consolidate?

In large, dispersed environments, identifying consolidation opportunities can be a time-consuming job, requiring the combined efforts of engineers and systems architects working with everything from asset management tools to network discovery applications, to performance monitoring utilities, to homegrown spreadsheets, to big, old-fashioned whiteboards in order to determine what pieces of your hardware and software infrastructure might be better off someplace else.

But a new segment of products—sometimes called data center intelligence or consolidation management tools—are promising to help you automate the consolidation process,

freeing up the time of some of your most valuable employees while simultaneously providing the hard numbers you may need to justify a consolidation project. And while these tools now come primarily from smaller vendors, the big guys are gearing up to include these functions in their own business systems management suites.

Here's the hot news from the consolidation front.

A Consolidation Tale

Bell Mobility, one of the largest mobile phone service providers in Canada, had a problem. More accurately, it had one problem (or crash) after another. Recovering some critical systems could take hours, disrupting services and costing the company serious money—\$2.1 million per day for one system alone. So in 2005 Bell Mobility launched a study to find a way to speed disaster recovery. One of the recommendations that emerged was to consolidate applications and servers in order to centralize recovery efforts, with the hoped-for side effect of improving server utilization.

At the beginning of the study, Bell brought in a consultancy to evaluate its operations and offer suggestions for where consolidation made sense. Michel Tremblay, manager for OSS network engineering

showed that if the company could consolidate its server pool by 25 percent (its goal for 2006), it would save \$1.5 million in hardware replacement expenses over the next two years—even without including ongoing support costs for the systems that would no longer exist. Numbers like those put Bell on a path to find a tool that could help it identify which systems were ripe for consolidation. Capacity analysis and asset management tools could do part of the job, but Bell found a product from a small vendor that seemed to address the heart of the issue.

Tool Talk

Bell originally had used startup Cirba's Data Center Intelligence tool purely for auditing purposes. But Cirba believed its tool could also do capacity planning and analysis. "They took it away and came back with a quick tool that could do just that," says Bell Senior Systems Analyst Lou Sachin.

Cirba claimed that its new tools could provide data center intelligence: detailed reporting of asset utilization in the data center combined with cross-referenced information about what systems could be consolidated based on factors such as a server's operating system version, its utilization percentage, its available memory, or seemingly trivial but often critical details

Estimates showed that if Bell Mobility could consolidate its server pool by 25%, it would save \$1.5 million in hardware replacement expenses over the next two years.

at Bell Mobility, thinks that's a good way to go. "If you support those systems, it's hard to say, I'm going to cut off my system by so much percent," he says. It's more likely, according to Tremblay, that an internal IT staff with relationships to the systems might be tempted to say, It's working, so why should I do this?

Disaster recovery benefits aside, estimates

such as the time zone setting of the system clock. The tool generates reports that help users identify consolidation opportunities without resorting to extended whiteboard sessions or trial and error. "What I really like is the way they can set you up for consolidation," says Andi Mann, senior analyst at IT consultancy Enterprise Management Associates. "The Cirba stuff gives you some

Kill the Beige Ones First

A simple, practical scheme for hardware consolidation

Neal Tisdale, VP of software development at NewEnergy Associates, an energy market services provider owned by Siemens, didn't require a lot of analysis to determine which of his machines needed consolidation. He found many of his best candidates by their color: beige. "We looked at our oldest, beige, putty-colored, 1990s highest-wattage, lowest-performance servers and started virtualizing those," Tisdale says.

And while he's aware that a wide variety of tools exist for measuring nearly every aspect of data center performance, he says that just by getting rid of the old boxes (23 servers consolidated to a pair of Sun 4100s running VMware virtualization software) he avoided an expensive upgrade to the cooling and power systems in his data center. That in turn helped him to postpone buying extra tools.

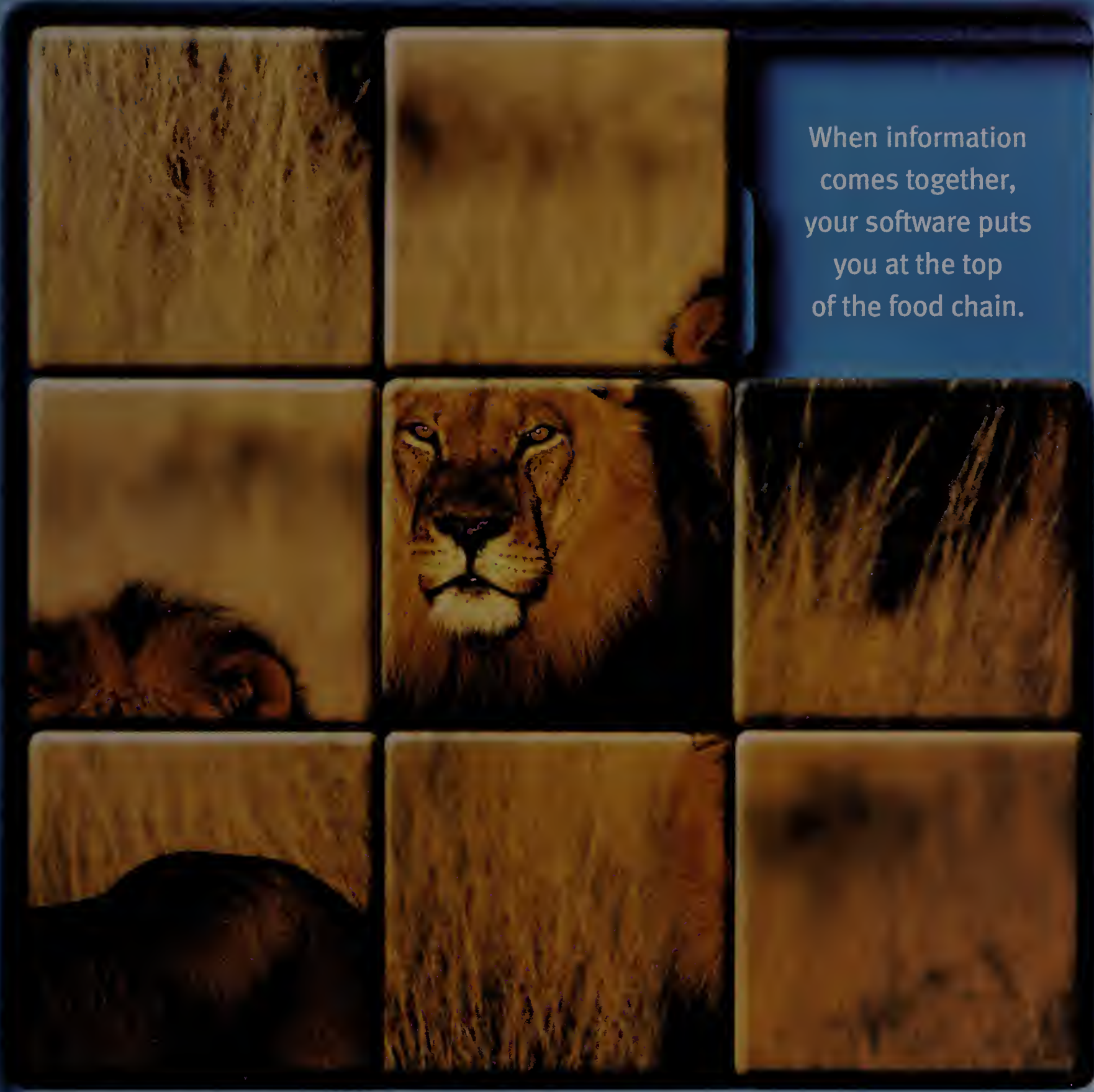
About the only consolidation tool Tisdale will recommend is a physical-to-virtual conversion tool called PowerConvert from startup PlateSpin, which helped him completely clone some older boxes right down to the MAC addresses on their network cards, thereby saving him from having to recreate from scratch ancient hardware configurations in a virtual space. PowerConvert is "a good time- and risk-saver," Tisdale says.

—C.L.

easy-to-use graphics and metrics on utilization and compatibility. You could probably achieve some of this with some of the high-level management-type tools from IBM and BMC, but Cirba provides sort of a one-stop shop for this specific functionality."

Consolidation-specific tools aren't a necessity, however, particularly for smaller companies, says Michael Minichino, director of infrastructure at marketing services provider Parago. Heading into 2006, Minichino had several new IT initiatives slated that would

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require either more space at his colocation facility or better use of the existing racks. Minichino was intrigued by the power-per-rack-space claims of new Sun hardware—the T2000 series of servers—and decided to try the latter route.

But he didn't bother looking for a tool to help him figure his savings; he went straight to spreadsheets. "We've purchased an asset management tool mainly for tracking workstations," Minichino says. "[But] I haven't really seen anything that would give me more of a return than spreadsheets." His calculations led him to cut 10 servers from his colocation facility.

For anyone looking to jump into the consolidation toolset on the cheap, Sun offers a free, downloadable Sim Datacenter Java application (www.sun.com/servers/coolthreads/simdatacenter) that can calculate the power, heat and space requirements of your current data center versus one with different hardware. (Sun supplies templates for its own and some competing systems, but you can also configure your own.)

Larger companies, however, may well see consolidation tools as a means of saving

With the nLayers tool, O'Neill is able to "let the machine do the inventory," and he can dedicate his engineers to more important tasks. NLayers also claims that its products can map the connections between systems and identify underutilized servers.

If all these tools sound to you like features that should be part of larger-scale asset management, configuration management or business service management tools, BMC Software, IBM and other large vendors want to meet you.

BMC says it already has a suite of tools capable of initial device discovery, performance monitoring and analysis, configuration management and ongoing optimization. What BMC's suite lacks, according to Dave Wagner, solutions management director for capacity management and provisioning at BMC, is an easy interface to tie all those operations together. But, he says, customers can expect to see the bigger vendors expand and improve their product lines, while the smaller vendors will consolidate or cooperate in order to provide the more wide-ranging management solution large corporations will need.

Getting in touch with server owners before you absorb their beloved boxes and applications into your data center will help smooth the path to consolidation.

time and effort. As part of an application consolidation and tracking effort, David O'Neill, executive director of IT at Boise State University, started using a service discovery tool from startup software vendor nLayers. Previously, identifying assets and connections between systems for audit or troubleshooting purposes meant making heavy demands on your systems engineers' energy. "You put your engineering staff at the whiteboard, give them a couple cans of pop, and they spend the rest of the day drawing pictures," O'Neill says.

Who's Being Served?

No matter how insightful they may become about the technical configuration of your infrastructure, these tools will never be able to map your consolidation efforts to the political and contractual landscape of your corporation.

Keep Up Online

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78% of respondents reported that server virtualization is either valuable or critical to achieving business objectives.

SOURCE: TheInfoPro

A word to the wise: Get in touch with the server owners well before you intend to absorb their beloved boxes and applications into your data center. This will help smooth your path as well as help you identify relatively early on in the process if there are good reasons (compliance, security or otherwise) for keeping some seemingly underutilized hardware right where it is.

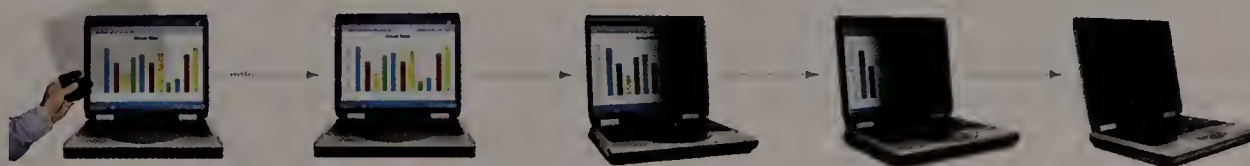
It's also worth noting that internal politics might be the least of your hurdles. "Quite often, [the difficulties lie in] vendor relations," says Bell Mobility's Tremblay. He notes that in one case Bell Mobility discovered a system consisting of 19 servers installed for one application by a certain vendor that Tremblay's team found could be consolidated to nine. Such inefficient installations are going to be a thing of the past, Tremblay says. "We now say 'no more,'" he insists, noting that Bell has created a policy of examining vendor architecture plans for efficiency before it agrees to an implementation. "[Vendors] have to start thinking of redesigning what they are selling" to make systems more efficient, Tremblay says.

If every IT organization does the same, your next consolidation effort could be your last. **cio**

Technology Editor Christopher Lindquist can be reached at clindquist@cio.com.

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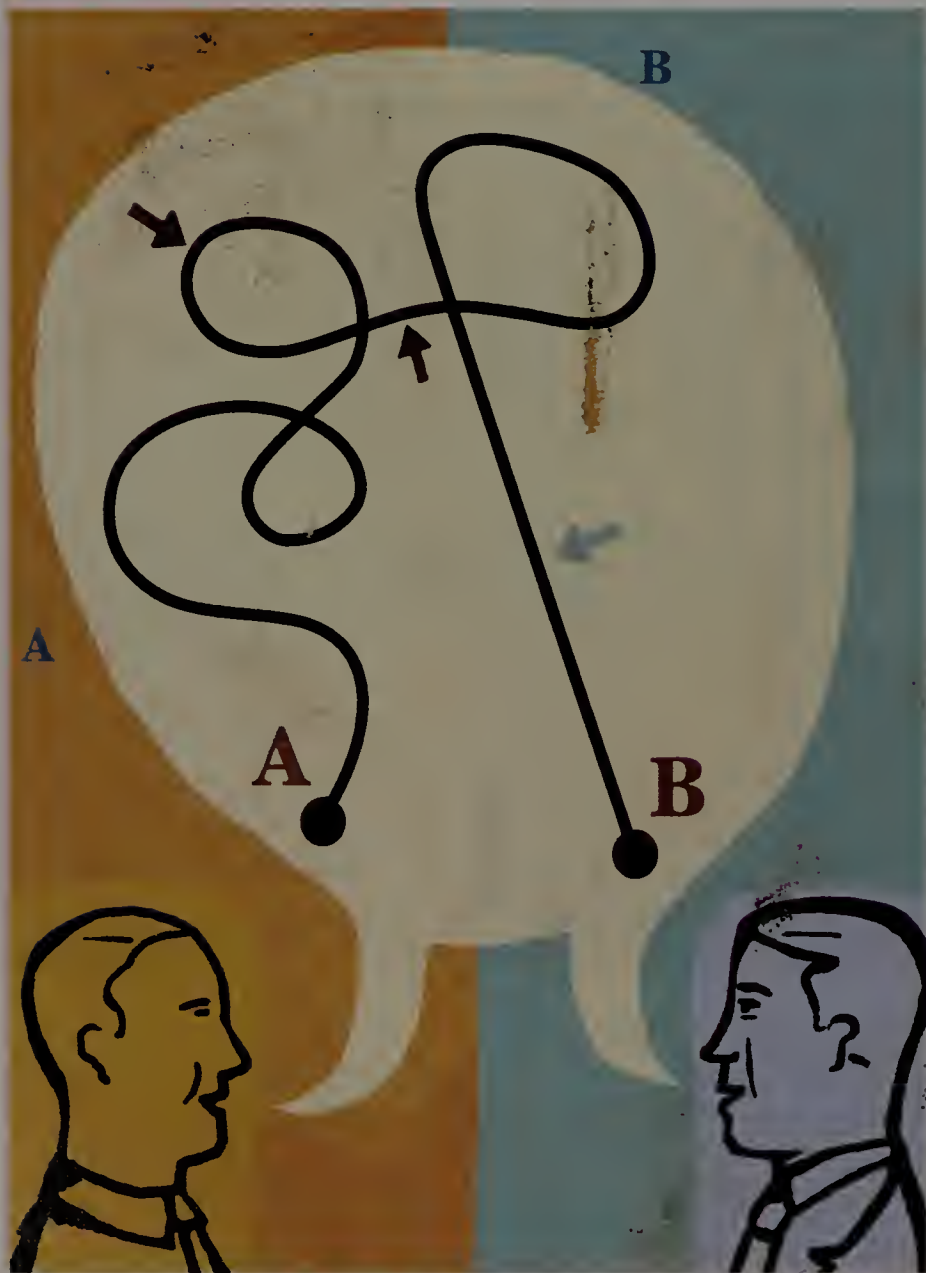


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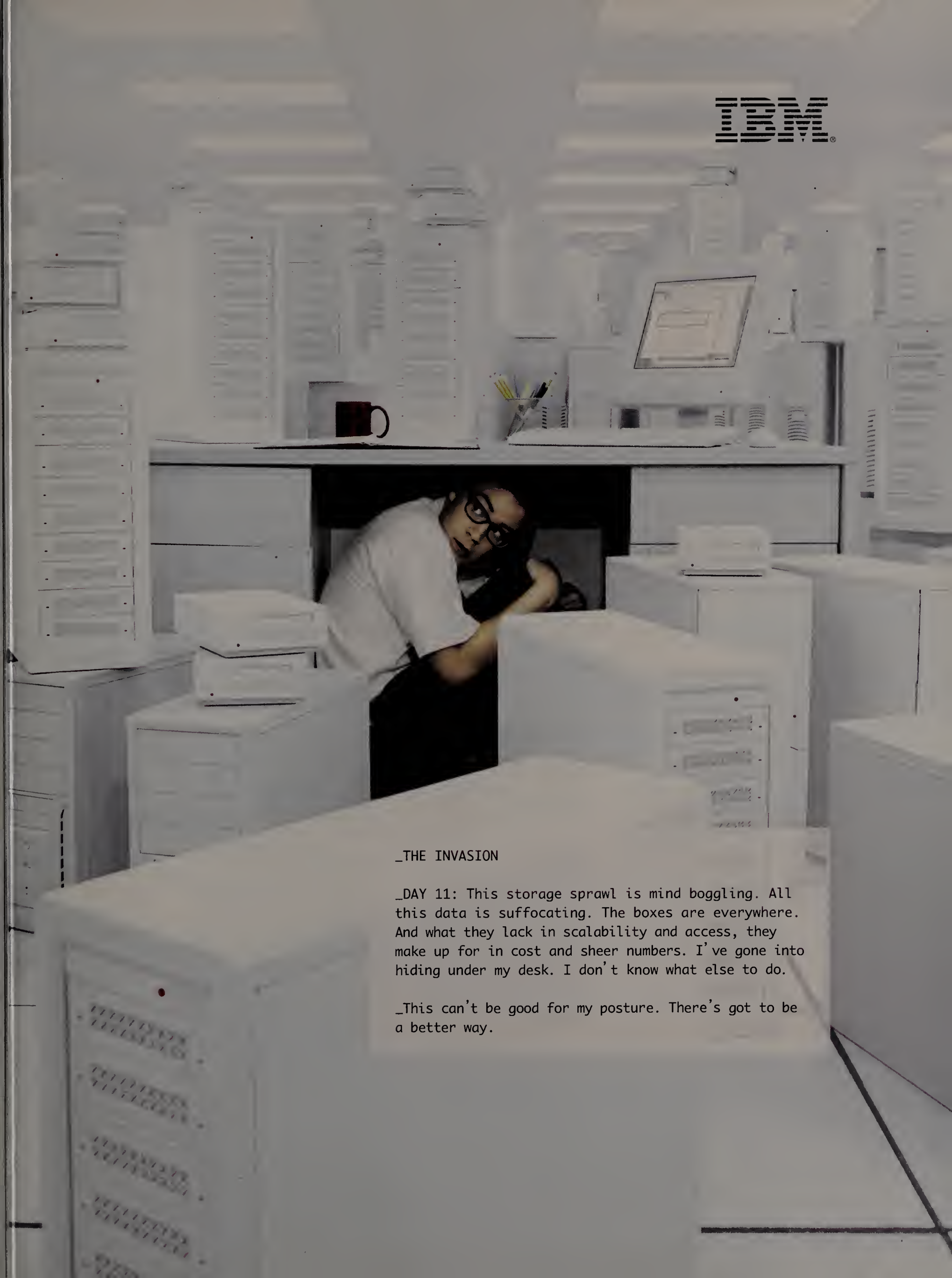


I started my career in IT in 1965, when I worked as assistant to the production manager for a company called Data Processing Consultants. I retired in December 2004 as the CIO and senior vice president, international and technology, with Ace Hardware. During those 40 years, I've witnessed the seminal events of the information age, from the introduction of the IBM 360 computer (the first family of mainframes with compatible operating systems) to the emergence of the Internet and wireless technology.

We all know how IT has revolutionized business. In a speech last year, Alan Greenspan credited IT in part for the resilience of the U.S. economy in the face of "stock market crashes, credit crunches, terrorism and hurricanes—blows that would have almost certainly precipitated deep recessions in decades past."

Given IT's impact, it would be natural to conclude that IT departments and the CIOs who run them are heroes. You would be wrong. Despite the dramatic and revolutionary changes implemented by IT, the IT department is still treated like a necessary evil in many companies.

We still have the reputation of taking too long, not delivering exactly what is needed and not being sensitive to the needs of the corporation. CIOs' job tenure is still relatively short, averaging just under five years. Nicholas Carr has convinced many non-IT executives that IT doesn't matter. Lacking a fundamental understanding of the value of IT, companies outsource some or all of the IT department. Many CFOs still look at IT as a cost rather than an investment. I've even heard comments by IT professionals suggesting that this is not a good career for their kids to pursue.



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Painful as it is to admit, this is our fault, because we fail to exercise leadership among our senior executive peers. We don't demand a strict adherence to the basic rules of project management, we're too willing to accept the blame, we're not always sensitive to the needs of the business and we fail to communicate our achievements.

Stop Taking the Blame

IT departments are staffed by people who thrive on getting systems to run. To many of them, time and budget is less important than getting it right. But business executives expect performance. When CIOs aren't skilled at setting expectations or are not at the table when decisions are made, oftentimes IT bears the blame if something goes wrong with the technology.

It's up to CIOs to change this mind-set by making sure business users and IT collaborate on systems development. CIOs

Developers took collaboration with user departments more seriously when we implemented incentives for achieving agreed upon budgets and time lines.

should not allow development to go forward without clear specifications from users (who tend to hope that IT can figure out what they want). CIOs must also insist that when users make major changes during development, these are documented and that user management signs off on new costs and time lines.

Several years ago Ace implemented an incentive program for developers that paid off only if they achieved the agreed-upon budget and time line for a project. Immediately, they took their collaboration with user departments more seriously. Both users and developers realized that there was a strong incentive to maintain the original schedule and put requests for additional functionality into future phases of a project.

IT also documented any modifications in monthly project reports, which we provided to everyone in the company. As a result, no one could say that they were not informed of and involved with project changes. This took pressure off of IT and assigned business users some of the responsibility for cost increases and delays.

Use Business Smarts

CIOs should speak like businesspeople. We should talk about trade-offs, backup plans and business strategy. We mustn't think that the toughest problems reside in the IT department. We must understand the cost structure of user departments and the pressures that users are under to achieve their goals.

IT must serve all of its masters in a company, not just the most powerful ones or the ones who shout the loudest. We must be aligned with corporate business needs, not with IT's needs. CIOs must play an active role here by making senior manage-

ment aware of new technologies and how those advancements can save the company money or increase productivity.

I learned this lesson back in the early 1980s, when Ace was using a very costly cut-and-paste process for producing our dealer catalog. We investigated what were then new laser printing technologies that could print both text and pictures. The system saved the company millions of dollars a year.

Demonstrate Results

It's hard to get recognition for your contributions when no one knows what they are. The post-implementation audit is one way to identify whether a system has achieved its promised results, but these reviews are seldom done in any formal way. As a result, advantages of the system become embedded in the cost structure of the user department and IT is never identified as the source of the improvements. Most IT departments

don't care about this because they are on to the next project. Meanwhile, the user department is more than happy to take full credit for the benefits.

I found it difficult to get my company to conduct post-implementation audits. A major reason is that these

can't be done just by IT. They depend on a collaboration between IT and the user department; the cost savings can be identified only by the users. The best way to achieve this is to make post-implementation audits a best practice within your company (and ensure that top management requires them). Making post-implementation reviews a function of a third-party organization such as internal audit helps to encourage all parties to participate.

When I have been able to do it, it has achieved the desired effect of proving the business case. For example, when Ace implemented a data warehousing system, our CEO demanded that the user departments quantify the long-term benefits before he approved the project. Once the system was implemented, he required the major users to report quarterly to the executive officers what benefits they were realizing from the system. By holding users accountable for the results, this approach ensures that future cost/benefit analyses will be more accurate.

If we can get users to understand that they must engage in pre-system development and post-implementation audits, we will ensure a higher degree of successful system delivery and accountability for results. Only when our colleagues know what to expect from us, when they understand what we do, and when they trust we understand their needs, will we begin to change many of the stereotypes that have followed us from the early days of computing. **CIO**

Paul Ingevaldson was CIO of Ace Hardware until his retirement in 2004. You can e-mail feedback to leadership@cio.com.





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Gifts that Keep on Giving

As top investment banks have discovered, giving away software tools to key customers and suppliers can save both of you lots of time and money



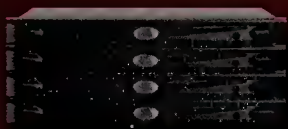
Frustrated by schedule slips and confused questions, a developer at one of the world's largest telecom companies did something he really wasn't supposed to do: He gave away his code to a key circuit chip supplier. His motivation wasn't generosity; it was self-interest. His company's supplier consistently had to run through two or three complex iterations to meet the software's evolving specifications. That prompted persistent delays in release dates, sometimes by weeks, and threatened other software development and manufacturing schedules. To accelerate the process, the developer had written a little personal tool that tested critical functionality of the supplier's embedded software. It worked.

In a blinding epiphany of the obvious, the developer realized everyone would benefit if he just gave away the code. So he spent 20 minutes writing documentation and another few minutes slapping on an interface he thought the supplier would find easy to use. It did. His under-a-hundred-lines software giveaway probably saved both companies well over \$500,000 in time and testing. Not only did the supplier's development team gobble up his code, they came back with ideas to make their module better. That previously personal tool had given the developer's company keener insight into its customer's software design sensibility. It produced better software faster based on that simple freeware "gift."

That's the kind of gift that more CIOs should insist their IT organizations give. After all, they have an untapped and underutilized asset that has strategic implications for customer and supplier relationships. The odds are excellent that their IT organizations are filled with portfolios of personal tools that,

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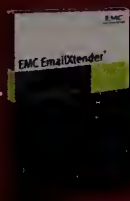


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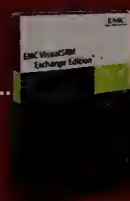


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with just a bit of thought and polish, could be externalized to save time, effort, and resources for key customers and suppliers.

Digital designers, developers, programmers and testers create these kinds of informal toolkits all the time. The catch is that they're almost always too personal; they're built for the express use of the individual and no one else. But, unsurprisingly, the potential value of these personal innovations can go far beyond the individual.

Most of the time, people have no interest in how you solve a particular IT problem. But for those aspects of a problem

attractive. They make it easier and safer for your customers and suppliers to take a chance on your innovations and change-management initiatives. CIOs should treat this as the enormous opportunity it is.

It's easy to imagine a store chain sharing some of its supply chain and inventory management tools with its key suppliers. Similarly, many companies reliant on CRM might benefit if their best customers could serve themselves with the help of the informal tools they're already using to customize the system.

Giving away software makes it easier for your customers and suppliers to take a chance on your innovations and change management initiatives.

(or opportunity) that they might like some control or influence over, they're very interested in whatever insights and shortcuts you might have to offer. If it's in code they're confident already works, so much the better.

These tools have particular credibility and authenticity because your people are already using them to make their lives easier. All it takes is a smidgen of ingenuity and investment to turn the tools into platforms that make the business lives of your customers and suppliers easier. Cost-effectively leveraging an existing investment is smart business.

Investment Bank Giveaways

The world's top investment banks are all familiar with this idea. Goldman Sachs, Credit Lyonnais and Merrill Lynch profitably peddle billions of dollars' worth of synthetic securities and derivative instruments to Fortune 1000 firms and hedge funds. For obvious reasons, many prospective customers for these "exotics" don't hesitate to use these complex instruments

for risk management and speculation. So what did the banks gradually realize? Listening to their customers and trying to sell to them wasn't good enough.

They began to give away their own tools. They gave their prospects the same

software "wind tunnel" and stress testing algorithms that they themselves used to design the instruments in the first place. They essentially told potential clients: Here, you can use the same tools we use to design and test our products to test them for yourselves. Go ahead and play until you're comfortable. If any questions or problems crop up, we'll be happy to address them.

In this growing era of open-source software tools and development, the economics of externalizing the tools your systems designers, developers and testers use become far more

While this approach most naturally lends itself to B2B interactions, little creativity is required to come up with scenarios where consumers can benefit from tool-sharing. For example, if Amazon or Apple iTunes programmers shared some of the tools they use to tweak and fine-tune the algorithms of their popular recommendation engines, it's likely that many customers would love to use them to better personalize book and song selections.

The CIO challenge is straightforward: What are the fastest, easiest and most cost-effective ways to learn what kinds of informal digital toolsets exist within the enterprise?

The next step is slightly more challenging but far more fun: What are the 10 or 15 tools that you're productively using inside the organization that might really have a *big* impact on a customer, client, business partner or supplier if you gave them away? Needless to say, this question creates the opportunity for all kinds of interesting conversations with marketing, sales and procurement personnel within the company.

The third step is the trickiest: What kind of marginal investments must you make to turn these informal tools into user-friendly, accessible and economically valuable tools for your target market? If the investment is more than marginal, it may ruin the economics of your initiative. And if the tools are simply too cumbersome or complex to be used by a desired constituency, they won't work.

But if you are a CIO who cares about innovation and who wants to cultivate a reputation for turning underutilized assets into new business value, deciding which tools to give away merits pride of place on your priority list. To be sure, this requires that you broaden and deepen your understanding of both your customer and your own organization. But really, shouldn't you be doing that anyway? **CIO**

Michael Schrage is codirector of the MIT Media Lab's eMarkets Initiative. He can be reached at schrage@media.mit.edu.



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Has the open-source era changed the very concept of what's proprietary? How does giving away tools you've spent time and money developing sit with you? Add a comment to the online version of this article. Go to www.cio.com/061506.

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Red Light, Green Light

How one CIO used project management discipline and the Traffic Light Report to align her IT department with her company's business goals

BY CATHERINE ACZEL BOIVIE



When I joined Pacific Blue Cross in 2003 as VP of IT, the CEO and I agreed on two foundational principles: 1. Technology has no value by itself, and 2. Technology management must switch its focus from operational to business enabler. These principles may seem self-evident, but the truth is, when there's a flurry of projects, all of them important to some aspect of the business, technology management can all too easily get swept away in putting out fires. This seemed to be what was happening at Pacific Blue Cross when I arrived. With nearly 2 million members covered, Pacific Blue Cross is the market leader in providing health-care and dental coverage to residents of British Columbia. Our subsidiary, Blue Cross Life, also offers life insurance and disability income protection.

While I understood my mission—turning the IT department into an enabler of business—the journey has been far from straightforward. It's been a long road with many bends and even a few dead-ends. Even so, there's no doubt we're making progress. How did we do it?

Project Management to the Rescue

First and foremost, we began to align every project to Pacific Blue Cross's Balanced Scorecard. The Scorecard shows and measures the organization's performance from six perspectives: qualitative, quantitative, infrastructure, clients, people and community-related goals. Every project is now justified in terms of how it supports the goals described in the Scorecard. That keeps the company's goals clearly in sight for all and shows how technology relates to and enables the business.

After assembling a list of all the projects we were working



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on, I introduced the project management office (PMO) function. This office oversees all projects of more than one month's effort—from the business case to a post-implementation review. We fashioned this as a corporatewide PMO, because all projects require disciplined management and almost all projects at Pacific Blue Cross have a technology component.

The business welcomed the PMO, since it gave it an overall view of all projects (in the planning, execution or close-out stages) as well as monthly updates on their status.

To ensure the success of this new process, the PMO (a manager, three project managers and two to five contract project managers, depending on the project mix) conducted three half-day workshops for personnel who would be managing or sponsoring projects. These sessions helped to obtain buy-in. But as theory is nothing without practice, the workshops were followed by individual coaching sessions for the project managers. Finally, we put all the project management-related processes online so that everyone has a shared knowledge base.

The PMO regularly reports project status to IT management, the executive committee and the board of directors through the aptly named Traffic Light Report. This report lists each project along with a short description, its schedule, the stage it is at and a status comment. Next to the project is a red, yellow or green symbol that quickly identifies whether the project is on time, on budget and on scope. The report is also posted on our intranet so that all employees can follow a particular project's progress. The Traffic Light Report has become a critical tool for demonstrating technology's value to the business.

Gate 1, Gate 2, Gate 3...

In my second year at PBC, I introduced IT governance—in the form of a gating process. Why wait until the second year? Because past experience has taught me that too much change, introduced too quickly, does more harm than good. Circuit overload may cause pushback!

Now, before a project can even get to the doorstep of the approval process, it has to be sponsored by a vice president. Only then is it ready for gate 1—or what we call the “thumbs up/down” gate. Here, the executive sponsor presents the idea to the executive committee, and the members give it a thumbs up or thumbs down. If the project is approved, the proposal continues to the next level (gate 2).

For gate 2, the sponsor presents a detailed cost-benefit analysis, because no matter how wonderful the idea, if the cost is too high for the projected benefits, that's it. If it passes gate 2 and is more than \$500,000, a gate 3 or detailed business case is prepared. Gate 4 is only for projects that have to be reviewed at the executive level because they cost more than \$1 million or are very complex. Gate 5 is the post-implementation review.

Last year, for example, our senior VP of client development presented a gate 1 concept of adding dental and extended health usage information to our member portal. The executive com-

Past experience has taught me that too much change, introduced too quickly, does more harm than good.

mittee gave his idea the “thumbs up.” The PMO then helped him to develop a gate 2 high-level business case, which was also approved. As a result, our members can now obtain information online about their coverage usage, thus reducing the number of calls to our call center.

Through our “gating governance,” everyone can see how projects are prioritized and approved. We're able to plan and measure benefits of projects and assess how they enable our business initiatives.

Even though projects of more than a month's effort are now overseen by the PMO, projects of smaller effort also need to be kept aligned with business needs. To do that, we established the change review board. Headed by a manager from the business area, this board reviews all change requests, assigning priorities based on how the change will enable the business. Three years ago, IT was swamped with more than 700 change requests and there was not much hope we'd get to all of them. So we asked all owners of change requests to resubmit any requests that were over a year old. With the change review board prioritizing the requests, we're now able to see which are the most pressing, which ones overlap and which will be superseded by some that are more encompassing.

In three years we've come a long way, and these new initiatives would not have succeeded without the active involvement of senior management and the IT team's hard work. But we still face a number of challenges.

For instance, we still need to do a better job of conducting regular postmortems of larger projects to gather lessons learned. And even when we do gather lessons learned on an ad hoc basis, we still aren't disseminating them to the appropriate personnel so they can learn from previous experiences. Some of the new technology we are implementing—portals, document management and knowledge management—should help with this.

The road to Rome wasn't built in a day. But there's one thing we're confident of: The framework we've put in place not only ensures that IT is already more focused on business, but that focus is advancing our business goals. In short, IT is enabling all the employees of Pacific Blue Cross to serve our members better. **CIO**

Dr. Catherine Aczel Boivie is the senior VP of IT at Pacific Blue Cross. She is the founding chair of the CIO Association of Canada and (perhaps the activity she enjoys most) a Big Sister. She can be reached at cboivie@pac.bluecross.ca.





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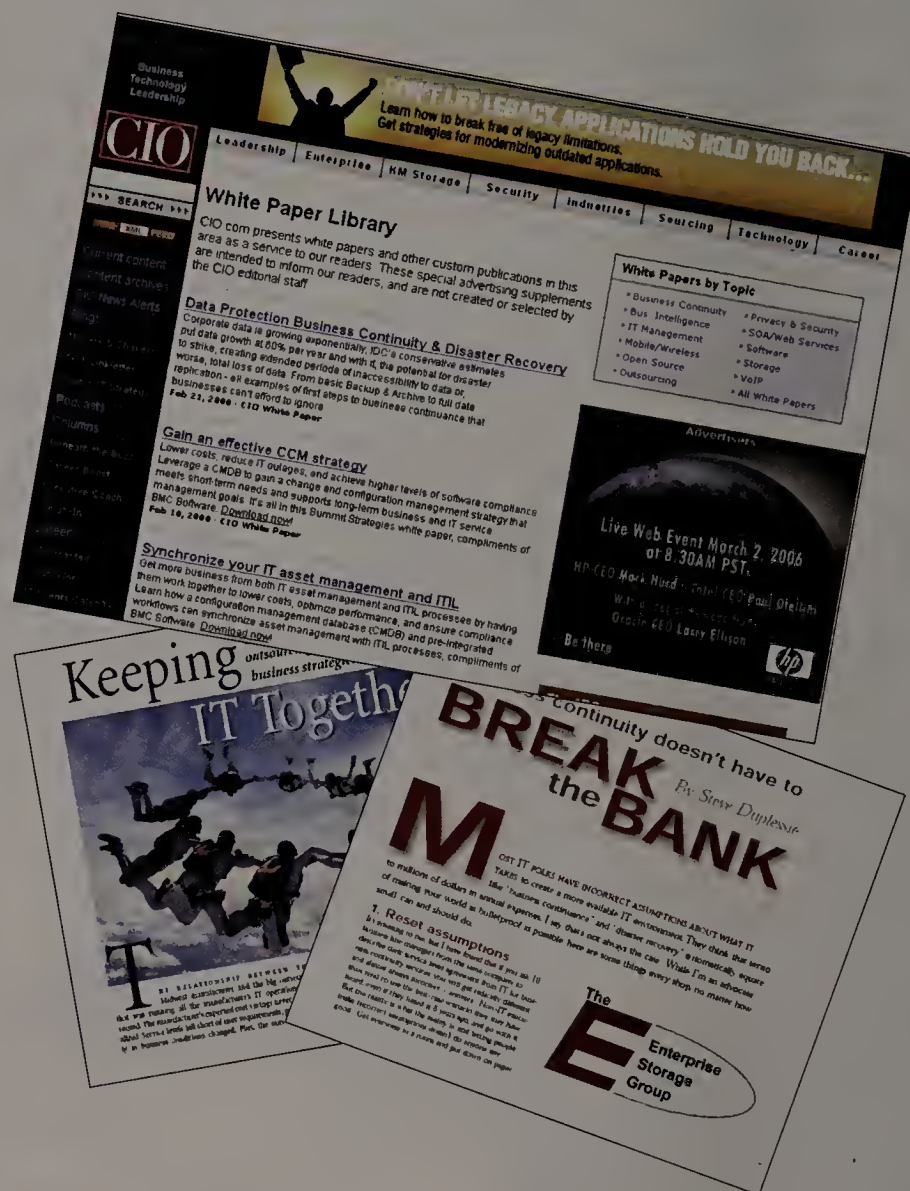
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SOA paves the way to easier,
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EXECUTIVE SUMMARY

BUSINESS INTELLIGENCE isn't what it used to be. No longer just an executive dashboard for strategic boardroom discussions, business intelligence (BI) has gone mainstream, enabling operations-level intelligence that enhances everyday decisions. Intelligence data must come from many sources – from data warehouses to the business applications themselves. And the only way that's going to happen is through integration, which often eats up as much as 70 percent of BI implementation budgets. Read this article to gain practical advice on building a unified integration BI strategy based on service-oriented architecture (SOA) and event-driven architecture (EDA) – without breaking the bank.

"I can't get that information because our systems just don't 'talk' to each other."

Sound like a familiar complaint?

For many CIOs, it's a sticking point that hits close to home, because the very information that should be at one's fingertips – but repeatedly remains at arm's length – can significantly impact the bottom line.

It's not that the data isn't there. Rather, it's everywhere, from data warehouses to operational applications. Users need complete, clean, up-to-the-minute intelligence that comes from an integrated infrastructure of systems that "talk" to each other.

With service-oriented architecture (SOA) and the less-discussed but equally important event-driven architecture (EDA) technology paving the way, there's no need for excuses.

There's Intelligence in Applications

As organizations continue to embrace operational business intelligence (OBI), the question of integration gains greater importance.

OBI systems draw information not just from data marts and warehouses, but also from a myriad of other sources like RFID devices, CRM solutions, handhelds and more. And, through Web services, data is even coming from vendors, customers and other third parties. Making matters more complex, these applications range from the home-grown to standards-based commercial packages and proprietary enterprise systems. Information from disparate sources must be prepared for manipulation, analysis, and delivery, in real or near-real time.

"People derive value from information when they get the right data coming from the right systems at the right time," says Jake Freivald, vice president of product marketing for iWay Software, a NYC-based Information Builders company and an innovator of enterprise integration solutions. "Sometimes people really struggle to get that data, so they try difficult tasks like sun setting or eliminating legacy systems – but that's a major risk, and it often doesn't solve the problem. The trick is getting the most out of what you already have."



Integration Takes Center Stage in Strategies

With seamless integration, any data is accessible – regardless of where and how it's stored.

"Even so, integration is always the biggest headache for organizations as they build and maintain complex IT infrastructures that impact critical business operations," says Kevin Quinn, vice president of product marketing at Information Builders, a NYC-based provider of business intelligence and real-time Web reporting. "In fact, integration is so time-consuming and expensive that it often eats up 70 percent of BI implementation budgets. One company we helped had four people doing BI, and 12 support-



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CASE STUDY

Putting SOA to Work in the Real World

One Information Builders customer needed to provide its call center reps with a complete, up-to-the-minute view of any customer at any given time. That view required two-way interactions with dozens of systems, including customer-facing Web-based applications, point-of-sale terminals, marketing, shipping, accounting, and so on. Imagine, for instance, a customer who has bought something online and is now trying to return it to a store.

By focusing on the available business data and the required business services, the company converted an existing data warehouse – previously only used by 100 business analysts – into a real-time data store that now serves more than 6000 call center personnel through a common set of reusable services. The company's BI system usage went way up, the cost per user went way down, and its call center reaped the rewards – as did its customers.

ing the data integration effort. That's the wrong ratio."

To start, a keen understanding of what users need is paramount. Identify the systems and applications that need to talk. Target the relevant data, from data fields and event triggers to Web services. Then, look for a solution that simplifies complex data environments.

CIOs need to develop data integration strategies that best fit their organizations' needs and business processes. Quinn says there are several options:

- Create decentralized aggregate data marts throughout your organization
- Take a hybrid approach by allowing drill-down from a warehouse to operational applications
- Leverage real-time transactions to alert users of events as they unfold

The Technology Behind the Tools: SOA and EDA

Any BI solution relies on integration technology to support its tools. "To do BI well, you need to anticipate technical heterogeneity and constant business change," says Freivald. "In other words, you need a flexible and highly interoperable integration platform."

Industry analysts often point to service-oriented architecture (SOA). "That's because service orientation aligns IT with business processes," Freivald notes. "Businesspeople – the ones who need to be served by service-oriented architecture – use business terms and business data to say what service they want. IT delivers a service that meets the need, regardless of what underlying applications they use to implement it. The applications become less important than the services they provide."

According to a report from Boston-based Aberdeen Group, a research company that explores technology's impact on business and consumers, "SOA middleware is the fastest way available to create powerful, re-usable business services from existing applications."

The SOA approach promises to eliminate time-consuming and costly custom integration code and simplify the skills needed for design, deployment and maintenance of OBI.

It's important to build event triggers into an OBI strategy by using an event-driven architecture (EDA) that allows messages to be shared between applications. "An event is a message that carries business data. It tells different parts of the business that something relevant happened. It can be delivered over any communication mechanism, with any enveloping of information," explains Freivald. For example, a "purchase order" message received from a business partner could be considered an event and could trigger

responses across ERP, accounting and CRM applications.

"A data integration platform based on SOA and EDA optimizes the utilization of a company's most data-packed IT resources," says Freivald. "And shouldn't a BI strategy tap into that?"

A technology called ESB (enterprise service bus) brings together service-oriented, event-driven and message-oriented approaches to integration. As the central component of such architectures, it enables organizations to create, compose, and manage services – whether invoked as Web services or through other interfaces. "An ESB offers a highly distributed, platform-agnostic approach to integration, providing standards-based support for messaging, Web services, routing and data transformation, without writing code," adds Freivald.

There are no more excuses for lack of information. The data is there. But it must be made accessible with the right OBI integration strategy.

To explore various BI integration options, check out Information Builders' BI Essentials [<http://www.biessentials.com/>], a resource library to help CIOs navigate the challenges of unifying integration for successful BI strategies. •

About iWay Software

iWay Software, an Information Builders company, accelerates business integration by providing tools that make service-oriented architectures easy to implement. For more information, visit www.iwaysoftware.com.

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THE TRUTH ABOUT SOA

In which we pour some cold water on the hype and answer your questions about why, how and when you should (or should not) start thinking about implementing a service-oriented architecture

BY CHRISTOPHER KOCH

CIOs are chasing a distant dot on the horizon called agility (the ability to change IT quickly to fit business needs) and the dot is receding.

Fast.

A recent survey by the Business Performance Management Institute found that only 11 percent of executives say they're able to keep up with business demand to change technology-enabled processes—40 percent of which, according to the survey, are currently in need of IT attention. Worse, 36 percent

Reader ROI

- :: Why service-oriented architecture demands a long-term commitment
- :: How to ensure that a service gets reused
- :: Why business process complexity is a prerequisite for SOA

report that their company's IT departments are having either "significant difficulties" (27 percent) or "can't keep up at all" (9 percent).

Service-oriented architecture, or SOA, is the latest in a long line of highly hyped strategies designed to bring that disappearing dot back into view. By mirroring in technology important chunks of business processes ("credit check" or "customer record," for example), SOA promises to give companies a portfolio of services that can be mixed quickly and matched expeditiously to create automated business processes, thereby reducing application development time and costs by as much as 50 percent.

From its humble origins in object-oriented design and component-based software development methodologies, SOA has moved into a rarefied realm of expectations. SOA, the story goes, isn't merely designed to remake IT; it's going to be a magic bullet to transform the businesses that IT serves too.

CIOs, usually a skeptical crowd, are helping drive these expectations. According to a recent Forrester Research survey, 46 percent of large-enterprise SOA users (and about 27 percent of SOA users at midsize and smaller enterprises) said they're using SOA to "achieve strategic business transformation." Surveys from other research companies report the same enthusiasm, with "competitive advantage" being the most popular expectation in a Summit Strategies survey, and the ability to "develop new capabilities and products" topping the list for Aberdeen Group's respondents. In a recent *CIO/Computerworld* survey, 77 percent of respondents said SOA would result in greater business flexibility.

And it may do all that and more.

Just not yet.

Even Harder Than You Think

SOA is far from being a proven concept (only 16 percent of companies in the Aberdeen survey have more than 24 months of experience with SOA technologies), and the companies that have had the most success with it so far are those that *always* have success with technology: big companies with big IT budgets whose business is technology-based (think telecom and financial services). They also tend to have supportive, technologically sophisticated business leaders.

For companies without these advantages, SOA may not be the panacea it's being made out to be.

That's because SOA demands a bigger investment and a longer strategic commitment than CIOs may think. The tactical part—service-oriented development—is a surmountable technical challenge. But the strategic part—creating an architecture based on a portfolio of services—asks that CIOs make a compelling case for enterprise architecture, a centralized development methodology and a centralized staff of project managers, architects and developers. It also requires a willing CEO and executive staff to pave the way for IT to dive in to the core business processes of the company. Understanding those processes and getting buy-in on enterprise sharing are the real sine qua nons of SOA-based business transformation.

For companies without technology products, big budgets or business leaders who chant the CIO's name every time he comes into the room, SOA is neither a guaranteed path to business transformation nor, in some cases, even desirable. For smaller companies, for companies that have made big bets on integrated application suites and for companies that already have solid application integration strategies in place, SOA isn't a "when," it's an "if." CIOs need to pursue an SOA strategy carefully because the service development and architecture planning pieces of SOA are distinct but not independent—they need to be considered and executed in parallel. Services built in isolation, without taking into account the architectural and business goals of the company, may have little potential for reuse (one of SOA's most important benefits) or may fail outright. Grand architectural planning exercises may drag on endlessly, without providing any real business benefit.

And that dot on the horizon, agility, is difficult to quantify. "We can't say, Do SOA because it will give you a much more flexible set of systems," says Daniel Sholler, Gartner's vice president of research. "There's no metric that says if I'm more agile I will save X percent. The number-one difficulty with SOA is that it's hard to get the ROI down to the spreadsheet level." Indeed, a survey by integration software maker WebMethods found that the top two inhibitors to SOA were, respectively, a lack of general knowledge and the difficulty of quantifying its ROI.

Indeed, there's no inherent ROI in any technology strategy, cautions David Johns, senior vice president, CIO



_INFRASTRUCTURE LOG

_DAY 8: I give up. Our infrastructure is so inflexible. Our apps and processes don't work together. We can't respond quickly to change. It's out of control.

_DAY 10: Gil had an epiphany. Duct tape. A few dozen rolls later and he's integrated everything, and everyone, by hand.

_DAY 13: I've found something better: IBM WebSphere middleware. It'll make our infrastructure more flexible by seamlessly integrating our apps, even those from SAP and Oracle. We can change processes in a snap, and IBM's industry-specific expertise helps enable a service oriented architecture.

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and chief supply chain officer for Owens Corning, a building materials manufacturer. Therefore, he says, "Developing a service-oriented architecture is not our goal. Driving productivity and driving waste out of the supply chain are the goals, and we'll look at technology solutions from that aspect rather than what the industry may say is the latest, greatest thing."

Some are even more dubious. "Companies are creating a complex bureaucracy around something that 90 percent of the time is overkill," says Thomas Gagné, CTO of InStream Financial, a software and financial services vendor. "Why are we replacing technology and obsolescing our employees' skills faster than we're realizing the benefits of the previous, now supposedly inadequate technologies?"

That's a difficult question CIOs need to ask themselves before entering SOA's business transformation revival tent. Here are a few more:

The Questions, The Answers

Q: SOA is a technology architecture. How do you make a business case for a new technology architecture?

A: You don't. "Don't talk to the business about SOA because the business doesn't care," says Forrester Research analyst Randy Heffner. The business's interest in SOA extends only as far as it cuts the cost of applications and gets them running faster. But simply rewriting code in the form of a service doesn't deliver those kinds of benefits. To start down the road to building an SOA, there needs to be multiple redundant IT applications that can be consolidated into a single service, or the possibility for multiple areas of the business to use a single service. To speak to the business, quantifying the redundancy helps. "I know for a fact that the same data is being extracted by at least 26 different applications in our environment for different purposes," says Jeff Gleason, director of IT strategies for Transamerica Life Insurance, annuity products and services division. "We're extracting it and paying to store it in all those different places. Just getting rid of those support costs is a big deal."

But there is also a flexibility quotient to SOA that can add value—if it is focused on a critical business process. At ProFlowers.com, for example, there are no redundant applications or multiple business units clamoring for

services. But splitting the flower ordering process into discrete services means each component can be isolated and changed as needed to handle the spikes in demand that occur around holidays, according to ProFlowers CIO Kevin Hall. When ProFlowers had a single, monolithic application handling the process, a single change in the process or a growth in transaction volume (on, say, Valentine's Day) meant tearing apart the entire system and rebuilding it. In the new system, a server farm responds to spikes in activity during each phase of the ordering process by transferring storage capacity to the specific service that needs it most. The system is much more predictable now, and there have been no outages since the service-enabled process was rolled out beginning in 2002, according to Hall. "Because we can scale horizontally [more servers] and vertically [splitting up services], I don't have to buy all the hardware to serve every service at its peak load," he says. "You don't have to be able to eat the elephant in one bite anymore."

Q: When is SOA not a good idea?

A: Complexity is the prime prerequisite for SOA. Small companies that are consolidated on a single infrastructure (like Microsoft) and don't have complex application integration requirements are not candidates for SOA. Larger companies whose application infrastructure comes mostly from a single vendor (60 percent or more, according to experts we spoke to) will want to think carefully about whether building their own SOA is necessary or wise.

Then comes speed, and the need for it. If processes don't need to change quickly, then transforming IT in order to be able to change them more quickly is pointless.

At Owens Corning, 75 percent of its software applications come from SAP. Owens Corning's products are manufactured and sold in similar ways around the globe, which means CIO Johns has long driven a strategy of business process integration through SAP's applications. "SAP is the integration strategy," Johns says. His goal is to unify all of the company's worldwide divisions on a single version, or "instance," of SAP running on a single database. He is also monitoring SAP's strategy of service-enabling its applications to create a ready-made SOA for its customers. (See "If You Can't Beat 'Em, Integrate 'Em," Page 58.)

Global manufacturer Whirlpool has also placed a big bet on SAP and global process integration, which, to Esat Sezer, the company's corporate VP and CIO, makes more sense than application integration. "I'm not dealing with that anymore," he says. "I have outsourced that to SAP. I look forward to SAP handling integration requirements that I used to have to handle myself."

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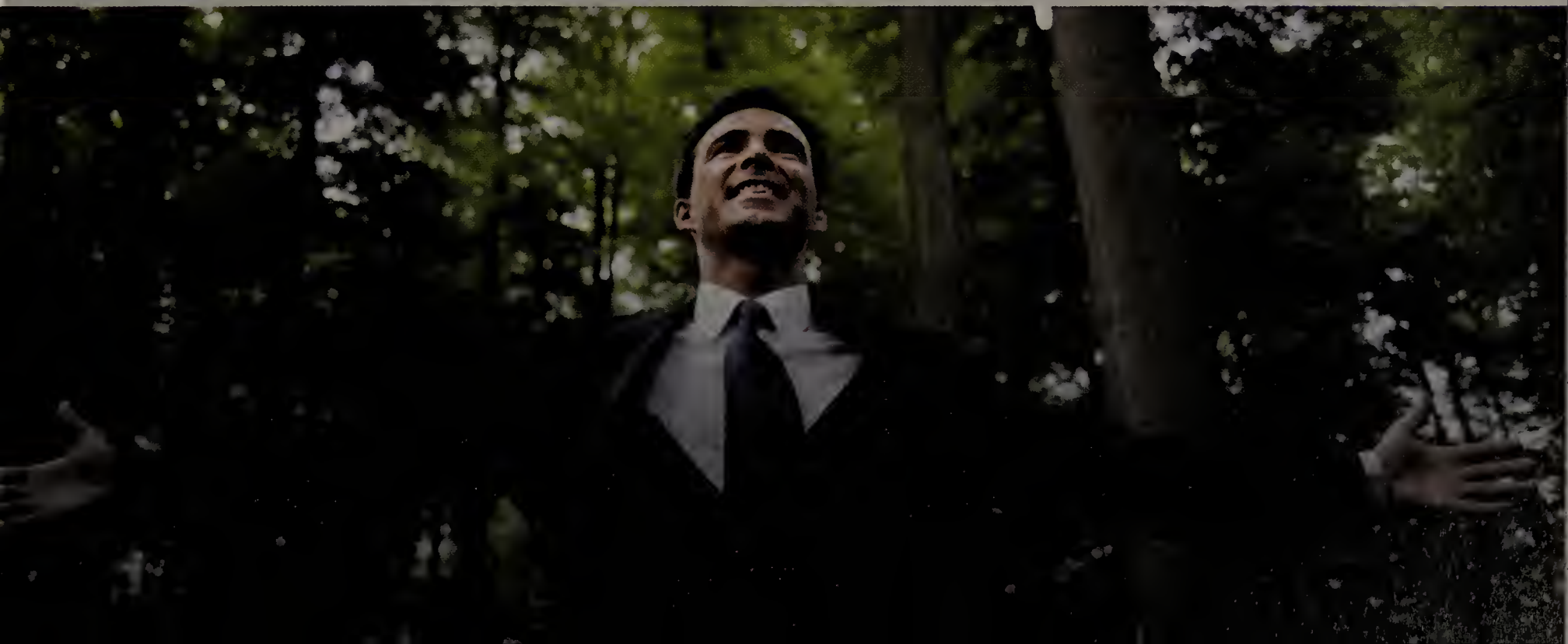
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Q: Creating a service requires more planning and design than traditional application development and integration. How much extra does service-enablement cost?

A: Forrester's Heffner estimates that the extra work involved in service-oriented development can range from 30 percent to 100 percent more at the design stage, which makes up 10 percent or less of the overall cost of an application project. The extra effort is necessary to create a service that can be used in many areas of the business, each with their own particular needs. Transamerica's Gleason says that, for example, services that deal with insurance premium payments from customers generally need to accommodate multiple delivery channels—say, a website, a bank wire transfer or a call center—depending on the process for each business unit. Understanding the ways each unit wants to consume the services is part of the design work and is critical to getting units to agree to use the same service.

But businesspeople are often aware of the extra effort required for services and may not want to pay for them. "I've heard this a hundred times," says Gleason. "A business sponsor says, 'Well, if you're going to make me pay for creating this service the first time, you just blew away the cost benefit of my project, and it's not going to get sponsored. And so I want you to go ahead and hard-code the integration because I need that functionality.' But then my job is to help them see how creating that service is not really a project artifact; it is a business architecture artifact. We're creating a piece of our business infrastructure that can be reused and changed. Once you get people to understand the requirement for doing that, then they stop worrying about whether it costs more to create it initially than it would to hard-code the thing."

Q: How much reuse can I expect from services? And what does that mean in real dollars?

A: Reuse of services can vary widely and depends on the rigor of the design, which in turn depends on the abilities and experience of the developers and project managers, says

Heffner. Reuse also depends on the level of architectural planning that surrounds the specific service. For example, a service has more chance for reuse if it is developed as part of a broad SOA strategy that includes uniform development methodologies, a centralized architecture planning staff and business analysts who can examine processes across the company and incorporate the unique needs of the business units into the design of the service. "If a service isn't designed with knowledge of how other parts of the organization may want to use it, it's unlikely that those groups will adopt it," says Gleason. Worse, designing a one-off service could lead to duplication of effort down the road. "You may need to create a second service to complement it because you don't have time to modify the first, or perhaps you're going to have to rebuild the thing because now it doesn't meet your requirements," says

Gleason. "In the long run, there's no hope for business process integration, or business process management, if I don't look at services from an architecture perspective."

But if a service can be reused even once, it can have an exponential effect on savings, according to Heffner. Even though services require more up-front design work, reuse means there will be no costs for design, coding or unit testing the next time

around. Together, these steps account for about 40 percent of a software project cost.

Veterans caution that it's difficult to predict the reusability of services. Sizing the services properly (known as granularity) so they don't try to do too much or too little is an art. "We have challenges with granularity," says Howie Miller, VP of integration architecture for IBM's internal IT group. "I'd say 30 percent of our assets drive 90 percent of the return because they are sized better," says Miller. Heffner agrees: "At one auto company I've talked to, they had some services that were used 20 times and others that were used only once."

Q: I need to show value to the business for everything I do. How do I balance the architecture planning with the need to prove value to the business quickly?

A: Architectural planning is time-consuming. Service-oriented development, drawing upon well-known pro-

"If a service isn't designed with knowledge of how other parts of the organization may want to use it, it's unlikely that those groups will adopt it."

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gramming principles and widely available technology standards (such as SOAP, HTTP and so on), can happen a lot faster. But the two need to happen in parallel, say experts. "We do development projects as needed and then on the side we have a longer multiyear project of mapping out the processes and building enterprise-level services," says Kurt Wissner, managing director of enterprise architecture and development for American Electric Power (AEP). "People need to see the benefit of SOA pretty quickly. That's why I like the project route, because otherwise you don't have anything tangible to sell to anyone about why you're doing this."

While it would help to have the architectural plan and the process mapping in place before building the services (to improve the chances for reuse), architecture planning has no short-term payback, which can be devastating. "I tried to boil the ocean at another company and I failed," recalls Wissner. "We did a big multimillion-dollar architecture plan that duplicated what we already had. It didn't provide much value over traditional point-to-point integration,

and we had nothing to show for our efforts. If you start with the entire enterprise, there are too many risks you might fail."

By taking the enterprise planning in smaller chunks at AEP, Wissner can more easily recover from setbacks. "We've had hiccups but could take corrective action because the issue wasn't that big," he says. "If you break it into simpler pieces, it's more easily digestible."

"Business processes change all the time," adds Praveen Sharabu, director of enterprise architecture and infrastructure for transportation company Con-Way. "Nobody can wait for two years while you document everything, and it will be obsolete by the time you finish."

Q: I can't afford to build a million different services. How do I know which services will provide the most value for my investment?

A: When in doubt, start with processes that involve customers, directly affect revenue and address a specific pain point in the business.

"Developing a service-oriented architecture is not our goal.

Driving productivity and driving waste out of the supply chain are the goals, and we'll look at technology solutions from that aspect rather than what the industry may say is the latest, greatest thing."

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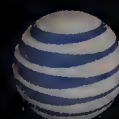
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A 2006 survey by the Business Performance Management Institute found evolving customer needs and preferences to be the top driver in business process change or the introduction of new applications, followed by competitive threats and new revenue opportunities. (Cost savings was a distant fourth.) “Externally facing applications are the ones that provide the most business value, and they have a good set of change requirements that come up very often,” says Gartner’s Sholler. “If you can improve those applications by 10 percent, it’s better than improving lower-level applications by 50 percent.” Of course, adds Sholler, SOA may not provide more value than, say, a good packaged application. “But if it’s something you would have to build yourself anyway, you need to do it service-oriented,” he says.

Q: How will SOA affect my IT group?

A: If you have a decentralized company, be prepared for a struggle. SOA drives centralization. Indeed, it demands it. “You have to have someone heading it up, and you have to have one individual or small team manage the architecture,” says Mike Falls, senior system engineer for Fastenal, an industrial and construction supply company. “If each team is left to itself, they may each come up with different ways of building services. You need one group, one set of research and someone to make sure the development groups are sticking to the service development methodology.”

As the service portfolio grows, the development process may begin to look like an assembly line. “It becomes a factory,” says AEP’s Wissner. “You have these different project teams that you funnel work through, and they can grow and shrink as required.”

Once the SOA factory gets ramped up, expect to add more project managers, business analysts and architects as the productivity of the developers increases, says ProFlowers’ Hall. “Two developers can now do the work of six,” he says. “That means the architects and project managers are running to keep up with the output of the engineers. We are probably doing 50 percent more work than we did three years ago.”

Those programmers need to understand object-oriented programming and distributed applications—and that means an investment in training. According to the *CIO/Computerworld*

survey, only 25 percent of respondents have the staffs they need for SOA—49 percent said they are planning or have training programs in place for current staff to bring them up to speed.

If You Can't Beat 'Em, Integrate 'Em

In the new SOA world, enterprise vendors suddenly are eager to make sure their application suites can play well with others.

In the '90s, your integration strategy was simple: Buy as many preintegrated applications from a single vendor as possible. That worked for you, and it worked extremely well for the vendor; integrated application suites fetched a high price and required long-term maintenance and support contracts that promised a steady, predictable stream of revenue from customers.

Even better, CIOs' fear of integration pain gave vendors a built-in sales advantage whenever a company wanted to add a new application to its stack. It was easier for the CIO

to pick a preintegrated application from the dominant vendor than to take a risk on a best-of-breed newcomer—even if its application had better functionality—because expensive integration disasters had become the much-publicized bane of the industry. Better to have disappointed users, CIOs reasoned, than headlines in *The Wall Street Journal*.

But the rise of service-oriented architecture has produced a shift in integration strategy. SOA makes the radical assertion that the enterprise application infrastructure is irrelevant. Technology is constructed according to services specified by the business, not by processes contained within

an enterprise application vendor's software box. In this scenario, packaged software is a piece of the service, just another component in a larger business process—such as an insurance claims process that links a jumble of functions and data inside ERP, CRM and old mainframe legacy sys-

“Two developers can now do the work of six. That means the architects and project managers are running to keep up with the output of the engineers. We are probably doing 50% more work than we did three years ago.”

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tems. The application's vendor doesn't matter anymore; the linkages between the applications is the important thing.

As a result, the vendors' integration strategies have become more important than the features of their software. (Both dominant enterprise software vendors, Oracle and SAP, have begun offering integration middleware to go along with their software suites, although both are sticking with the big, integrated software suite vision.)

In the brave new world of SOA, the big software vendors have decided to take a page from Microsoft's playbook and duplicate the Windows strategy. With the Windows operating system running on 95 percent of PCs, software developers are eager to create software that works with Windows because it means they can reach the most customers and make the most money. As a result, the thousands of applications available for Windows today ensure its dominance in the operating system market tomorrow. Similarly, the big enterprise software vendors are trying to ensure their futures in an SOA world by assembling ecosystems around their core applications.

For example, the most startling change in strategy comes from SAP, long the dominant player in ERP. For years, SAP resisted alliances with other software vendors and insisted on building its own applications. But post-SOA, SAP is busy service-enabling its applications and using its new middleware software, NetWeaver, to entice companies to build software to run on the NetWeaver platform (which incorporates Web services standards). Online CRM software provider Salesforce.com has created AppExchange, where developers can download free software to integrate their software add-ons with Salesforce's core software. Oracle, meanwhile, has been busy building its platform through acquisitions, including middleware software that is the linchpin for its SOA pitch.

With CIOs reluctant to upgrade to new versions of enterprise software, the big vendors are saying, "Look, we can't sell with our old value proposition anymore," says Gartner's Sholler. "So they're trying to make [their software] the foundation for other solutions in markets they haven't been able to reach."

But this strategy has put the enterprise application companies on a collision course with traditional middleware

providers such as BEA, IBM and WebMethods, which are coming to the SOA party from the bottom up, through the integration infrastructure layer. "Everybody is winding up tangled up in the same space," says Sholler.

Although the integration infrastructure companies have much more experience with the foundational elements of SOA, all vendors are looking to build long-term relation-

ships with customers. Consequently, despite the abundance of Web services standards embedded in their products to ease integration headaches, everybody has a proprietary hook somewhere. Oracle's Fusion applications will work only with Oracle's database. SAP's new applications require NetWeaver middleware, according to Gartner and Forrester Research. Even the integration infrastructure companies have enough proprietary elements to make it difficult to swap out their integration software.

The bottom line for CIOs?

Beware vendors pledging to build your SOA for you. Unless, like Whirlpool's Sezer, you're not worried about dependence on your vendor, which in Sezer's case happens to be SAP. "What's wrong with being dependent on a vendor as long as I'm providing value to my company with the solution?" he asks.

But CIOs on the whole fear dependency, especially in the current wave of consolidation, according to a 2005 Accenture survey of CIOs. While 65 percent of CIOs said vendor consolidation makes for a more integrated software infrastructure, and 61 percent believe it will reduce their vendor management burden, 87 percent said vendor consolidation will lead to lock-in, 61 percent believe it will decrease price competition, and 57 percent believe it will reduce pressures for vendors to innovate. Only 35 percent saw vendor consolidation as a good thing.

For SOA believers like Transamerica's Gleason, annuity products and services division, an independent SOA controlled by the CIO is one of the best protections against lock-in. "No one vendor can be all things to everyone," he says. "There's always going to be somebody out there who will be able to do a piece of your process better than anybody else can. And the first company to adopt that is going to have competitive advantage." **CIO**

"No one vendor can be all things to everyone. There's always going to be somebody out there who will be able to do a piece of your process better than anyone else can."

—DIRECTOR OF I.T. STRATEGIES JEFF GLEASON,
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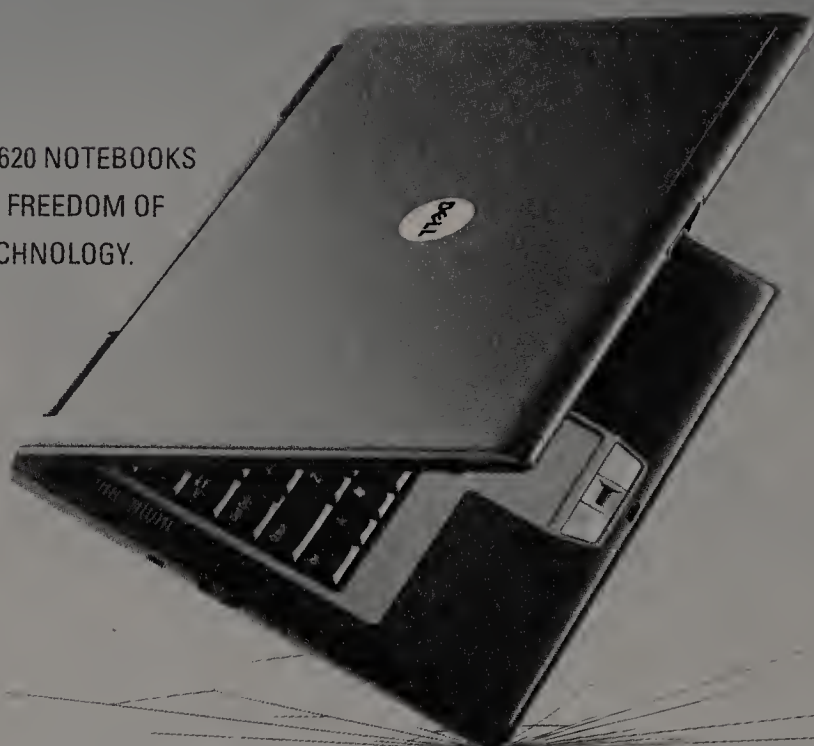
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BY
THOMAS
WAILGUM

Oliver Tsai sees it every quarter:

Fresh-faced medical students, new to Sunnybrook and Women's College Health Sciences Centre and armed with the latest Wi-Fi-enabled laptops, see no reason why they shouldn't be able to hop right onto Sunnybrook's wireless network with those shiny new laptops they just bought.

The same scenario plays out with doctors and office managers and anyone else whose new gadget automatically sniffs the airwaves and picks up signals from Tsai's wireless LAN, or WLAN. "They can see what's available, but because of the security, they can't access the network until the device is properly configured," says Tsai, the director of IT at the academic health sciences center in Toronto. It's a look-but-don't-touch situation that can frustrate users—but, Tsai says, it's a necessary, if temporary, frustration.

Whether they're medical students, CEOs or cube dwellers, today's mobile phone and BlackBerry-equipped workers are clamoring for even greater wireless access while on the job. It's nearly certain that their company-issued laptop has a Wi-Fi chip built-in,

Reader ROI

- How new wireless security technologies can eliminate old fears about Wi-Fi
- Policies you need for wireless implementation
- How other CIOs deal with wireless security issues



"It's critical that enterprise environments have the tools that allow them to police their own networks," says Sunnybrook and Women's Director of IT **Oliver Tsai**.

Wireless Security

and they see no reason to be shackled to their desks anymore.

Yet IT executives are still distrustful of wireless LANs because of perceived security nightmares such as wireless denial-of-service attacks and network breaches. "They are scared," says Nick Selby, an enterprise security analyst at The 451 Group. A December 2005 Forrester Research report echoes Selby's take: Security is the number-one obstacle when acquiring wireless technologies, regardless of industry.

But some of those fears may be based on old news. "Most of the security problems that have scared away early adopters have been solved," says Selby. New authentication and encryption schemes (such as 802.1x for user access and 802.11i advanced encryption standard, or AES) are more vigorous. And vendors now offer intrusion-detection products and architectural schemes that make enterprise wireless networks just as safe as wired ones.

"Most of the things you'll need to do [for security] will come from the vendor. It's just a question of turning it on," adds Selby. Last year, Gartner went so far as to say that Wi-Fi was one of the most overhyped IT security threats.

So for 2006 and beyond, here are the five security areas that will help you and your users get the most from a wireless LAN—without all the nightmares.

Start Planning

First questions first: Why do you need a WLAN? Who's going to use it and for what purpose? And what are the necessary internal and external safeguards? By answering those questions early, CIOs can also determine just how much security their WLAN will need.

IS Director Bill Tomcsanyi's initial plan last year was to implement a wireless network beginning in the emergency department at Torrance Memorial Medical Center. The more he looked at then-current security safeguards, the efficiencies his clinicians and administrators could realize, and the relatively low cost to install the network, the more he thought of enveloping the entire hospital and other buildings on campus, which is what he did. "[Wireless] is absolutely an integral part of our five-

year information technology plan," says Tomcsanyi. "In the end we're providing faster patient care and eliminating all of the things that could lead to errors."

Once CIOs have an idea of what they want, the next challenge is to quantify the capital outlay and the expected benefits—

but don't expect to produce hard numbers. "We haven't been able to quantify why these networks are worth making the investment," says Joel Conover, a research director with research firm Current Analysis. Instead, the benefits are mostly soft, such as increased productivity and effi-

YOUR GUIDE TO WIRELESS STANDARDS

802.11 is a group of wireless networking standards, also known as Wi-Fi, set by the Institute of Electrical and Electronics Engineers (IEEE). A guide to the major flavors:

- 802.11a** Standard for a wireless network that operates at 5GHz with rates up to 54Mbps.
- 802.11b** Standard for a wireless network that operates at 2.4GHz with rates up to 11Mbps.
- 802.11d** Specification that allows for configuration changes at the media access control, or MAC, layer to comply with the rules of the country in which the network is to be used.
- 802.11e** Standard that adds quality-of-service features and multimedia support to the existing 802.11b, 802.11g and 802.11a wireless networks.
- 802.11g** Standard for a wireless network that operates at 2.4GHz Wi-Fi with rates up to 54Mbps.
- 802.11h** Standard that supports Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) requirements to ensure coexistence between Wi-Fi and other types of radio frequency devices in the 5GHz band.
- 802.11i** Standard specifying security mechanisms for 802.11 networks. 802.11i makes use of the advanced encryption standard, or AES, block cipher. The standard also includes improvements in key management, user authentication through 802.1x and data integrity of headers.
- 802.11j** Specification for wireless networks that incorporates Japanese regulatory requirements concerning wireless transmitter output power, operational modes, channel arrangements and spurious emission levels.
- 802.11n** A task group of the IEEE 802.11 committee whose goal is to define a standard for high-throughput speeds of at least 100Mbps on wireless networks. (The standard is expected to be ratified by 2007.)
- 802.11x** A standard for port-based authentication, first used in wired networks, that was adapted for use in enterprise WLANs to address security flaws in WEP, the original security specification for 802.11 networks.

SOURCE: Wi-Fi Alliance

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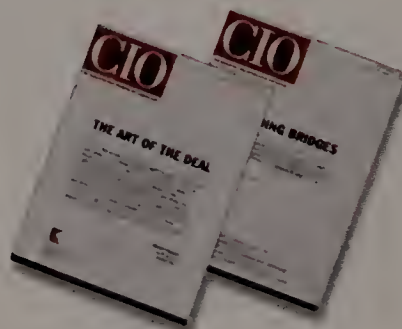
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DON'T SIT BACK AND WAIT TO BE ATTACKED; NEW TECHNOLOGIES CAN DETECT, LOCATE AND SHUT DOWN ATTACKS BEFORE THEY DO DAMAGE.

ciency because users can go anywhere (conference rooms, outdoor patios, the cafeteria) and tap into the network if there's a wireless access point (AP) in range. And even without hard ROI, some CIOs find adequate value. "[Our users] can stay connected to Lotus Notes and the CRM and ERP packages, and can clearly and easily move and stay connected consistently," says Steve McDonald, VP of IT of Optimus Solutions, a \$92 million integrator and reseller of software and hardware. McDonald has covered some 25,000 square feet of space with nine APs using 802.11b/g networking capabilities.

But Ellen Daley, principal analyst with Forrester Research, sums up the consensus of today's WLAN deployments: "For primary data access to every network in the enterprise, [Wi-Fi] is really an additive—not a replacement [for the wired network]. And it's an additive cost." Payback figures from WLAN vendors are a bit rosier. On a typical installation using 802.11a, b or g, for example, Nortel claims that organizations can realize a 2 percent to 3 percent productivity improvement for users and a payback on the WLAN investment in a year's time.

Write the Book

The industrious cube dweller or visiting contractor who plugs his wireless router into an Ethernet port probably doesn't have evil intentions. But it's up to you to make it clear to every user how bad such behavior can be: This rogue access point now sits behind the outward-facing protection of the firewall and can't be detected by most

intrusion-detection systems, and somebody sniffing the air with a simple, inexpensive handheld device or wireless-enabled notebook could lock on to the signal and have full access to the corporate network. "You have to define the policy for your wireless LAN: when people can use it, the restrictions on use, or guest-access use for consultants and partners," says Daley.

CIOs cannot overestimate the amount of user education needed for a wireless LAN policy. Users don't need to know how to tell a MAC address from an SSID, but they do need to know right from wrong. For example, they need to know about being tricked into accessing a wrong (and potentially malicious) access point that doesn't belong to their organization. "It really requires that awareness of a new set of risks that this freedom permits," Selby says.

Next, CIOs all agree that any new wireless policy must dovetail with the existing wired policy. "You have to follow the same rules of the road for wireless that we follow in the wired environment," says Bryon Fessler, CIO and VP of IS for the University of Portland in Oregon. Since last year, Fessler has rolled out 50 access points in three buildings on campus, with plans for at least 25 more in the future. He takes every opportunity (face-to-face discussions, e-mails and other get-togethers) to ensure that the 4,500 students, faculty and university members understand the reasons behind his wireless LAN policies—why, for example, student laptops have to be quarantined, inspected for viruses and credentialed before they can connect to the WLAN.

Always Authenticate

Where wireless education ends, authentication and encryption technologies step in as the enforcers of policy—they're the teeth when all the talking stops.

Wireless: Are You Scared?

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Wireless Security

Authentication is one of CIOs' first lines of defense. Boiled down, it is the ability to ensure that the client (laptop or other device) asking to latch on to the network signal is both what it claims to be and has been given permission to use the WLAN.

Right now, the 802.1x standard for port-based authentication, which originated in the wired networking world and has been retrofitted for WLANs because of the deficiencies of the wired equivalency protocol

(WEP), is one of the top tools for credentialing users. The protocol behind 802.1x is called EAP, for extensible authentication protocol, and it uses encrypted tunnels to exchange information (user names and passwords) between device and network. According to WLAN vendor Aruba, although an intruder can monitor the exchange over the air, data inside the encrypted tunnel cannot be intercepted. Because EAP is used on wired networks,

it's attractive to CIOs pushing a unified network strategy. Its mutual authentication ability gives users the added protection that the network they're seeing is actually legit—and not a hacker's fake access point (referred to as an "evil twin"). Client-based software from vendors such as AirDefense and AirMagnet can help as well.

Tsai of Sunnybrook and Women's uses protected EAP for his authentication to access the corporate wireless data network.

Since he's a Microsoft shop on the systems side, Tsai is able to take advantage of the controls in Windows XP, which supports EAP.

Another authentication scheme that bridges the wired and wireless worlds is called NAC, or network admission control. This Cisco-led initiative is a network-based policy that ensures that devices looking to hop onto a WLAN are both trusted and free of worms, viruses and spyware. At the University of Portland, Fessler uses NAC to quarantine new devices, run diagnostics and then allow users onto both the wired and wireless LAN; his system also uses an Active Directory database to verify users in the system and grant them access to an ERP system or student database, for example. "It applies the trust-and-verify" line of thinking, he says, that works very well in an open university environment, where students have a notion of many technological freedoms.

Encrypt Well

Authentication and encryption go hand-in-hand, and in March, both received a much-needed boost when the Wi-Fi Alliance announced that WPA2—the strongest encryption specification for 802.11—was now mandatory on all Wi-Fi products. WPA2

"You have to follow the same rules of the road for wireless that we follow in the wired environment," says **Bryon Fessler**, CIO and VP of IS, University of Portland.



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stands for Wi-Fi Protected Access 2 and is the long-awaited successor to WPA (which itself supplanted the earlier WEP standard). "WPA has some questions, but WPA2 is pretty darn good," says The 451 Group's Selby.

Whereas authentication is about ensuring mutual trust between device and network, encryption is about making sure the connection and data transfer is safe, "so that someone with malice couldn't start

to police their own networks," Tsai says.

And for those CIOs who still say no to WLANs, they'd better make certain that's really the case by monitoring their airwaves. "It's strange: Let's deploy Wi-Fi sensors in an environment where you have not deployed Wi-Fi," says The 451 Group's Selby. "But having a way to search for rogue networks is a must."

Sunnybrook and Women's Tsai has spread out 300 APs over three distinct

recently acquired by Cisco) inside his Cisco infrastructure. "At a centralized level, we can see the rogues and shut them off."

Segregate Traffic

Though it may seem like an insane idea to some security-minded CIOs, many IT execs are opening their wireless networks to the public: guests and business partners who want to surf the Web and check e-mail while in the buildings. Tomcsanyi says that

CIOs NEED TO REALIZE THAT SECURITY MECHANISMS HAVE FINALLY CAUGHT UP WITH WIRELESS HYPE.

looking at the packets," says Tomcsanyi. Laptops and access points with WPA2 inside use the advanced encryption standard to provide the top level of security.

If CIOs want to dive deep into the technical schematics of WLANs and access points, they certainly can. But thanks to the maturing vendor technologies, the encryption plan is fairly straightforward: Just turn WPA2 on. "It sounds like a very complex situation, but it's not," says Optimus Solutions' McDonald.

Of course, the base elements of authentication and encryption require industrial-strength user names and passwords—ones where attackers cannot easily guess them (such as eight or more characters and a mix of alphanumeric and other characters). That concept should "almost go without saying" in this day and age, but according to Daley, "you'd be surprised at how many companies don't do that." That sentiment is backed up by security vendor Kaspersky Labs, which estimates that about 70 percent of Wi-Fi networks do not use any type of data encryption.

Sniff Out Bad Guys

A significant security mindshift during the past several years has been the change from a defensive WLAN posture to one that is more offensive. CIOs shouldn't sit back and wait to be attacked; new technologies can detect, locate and shut down attacks before they do damage. "It's critical that enterprise environments have the tools that allow them

campus environments in the Toronto area—two urban and one suburban campus. He uses an AP detection-scanning technology that's built into Symbol's WLAN products, and his experience verifies the notion that dense, urban areas are much more dangerous than suburban locales. "There's a significant number of rogue detections in the hospitals downtown surrounded by offices and apartments," Tsai says. At the suburban campus, "we pick up very few."

While intrusion-detection systems, or IDSs, aren't all that new, it's the new prevention part of the IDS equation that is helping to cut off threats before they can manifest. At Torrance Memorial Medical Center, Tomcsanyi has a detection system in place and is rolling out a new prevention element by the third quarter of this year. "This takes more of a proactive approach," he says. Using new technology from vendors such as Aruba, the access points act as both radio frequency connectors and wireless sensors for intrusion prevention, which can save on costs from having to install both the APs and a separate IDS. (Tomcsanyi, however, says he plans to continue using multiple security systems—such as a new intrusion-prevention system from Cisco to be installed later this year—in concert with each other.)

"Anyone who doesn't monitor their WLAN is looking for future problems," says Fessler, who uses a detection and prevention product from AirSpace (which was

his ability to give patients and other visitors wireless access is a valuable asset in the health-care field.

Torrance Memorial Medical Center has 211 APs throughout its five-building campus that provide 100 percent wireless coverage, Tomcsanyi says. He is able to offer public Wi-Fi because he has the ability to segregate traffic within the network architecture. There's an open network just for patients and guests, and a secure corporate network that provides the encrypted connections for employees. The two networks stay separate, he says.

According to Cisco, a wireless guest network is an easy way to allow access while eliminating the need for IT personnel to authorize each user. Guest networks use an open security method segregated on a specific SSID (a unique name for each WLAN) that routes traffic to a network that accesses the public Internet only. Tomcsanyi cites increased patient satisfaction levels because of the WLAN access.

While wireless networking has come far in a short time, CIOs now need to realize that the security mechanisms have finally caught up with much of wireless's blistering hype. "It used to be that you're going to have to sacrifice some security policies and procedures because you want to have that wireless connectivity," Fessler says. "Now I'm not having to sacrifice that." 

Senior Writer Thomas Wailgum can be reached at twailgum@cio.com.



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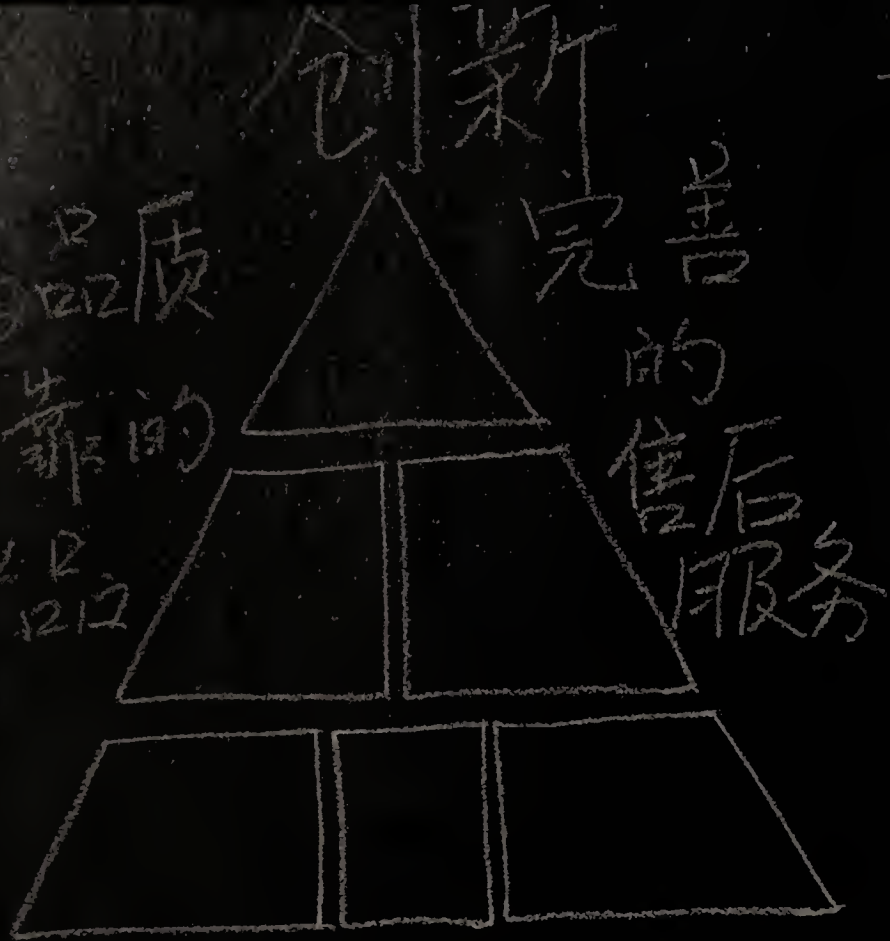
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Steve Bandrowczak,
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The China Gambit

China, starved for executive talent, is importing CIOs from the West. And discovering how IT works—and doesn't—in this emerging factory to the world is supercharging their careers.

BY STEPHANIE OVERBY

Last year, Steve Bandrowczak jumped at the chance to take on a new challenge: the top IT job at PC maker Lenovo Group, a Chinese company.

"I've rolled out systems in 200-plus countries," says Bandrowczak, a 25-year IT veteran, describing his experiences as a globe-trotting CIO, including setting up Chinese distribution centers while head of IT for DHL Worldwide. "I've overseen 43 mergers. I've built and shut down data centers around the globe." But now Bandrowczak is poised to tackle a job that few American CIOs would have even considered until recently: managing enterprise IT in China.

"It's an exciting—but formidable—challenge," says Bandrowczak. "From a career perspective, it's the first time I've had the opportunity to build the center of a company's IT capabilities *in*

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Bandrowczak’s mission is to build a new data center and IT development center in Beijing as the primary pieces of a global IT infrastructure that will support the aspirations of Lenovo, which made its first major move abroad by acquiring IBM’s PC division last May. But managing major IT operations in China in some form or another is becoming less of a foreign concept for American CIOs.

One reason is simple supply and demand. Experts say there’s a shortage of local IT executive and management talent in China, not nearly enough to keep up with local needs in an economy that’s been growing at nearly 10 percent annually over the past two decades. Today, China has between 3,000 and 5,000 executives with experience managing in a multinational environment, according to the McKinsey Global Institute. But given the country’s global

“Either things happen very rapidly or nothing gets done at all. There’s **not a lot of middle ground.**” —MATT BRENNAN, CIO, ASIMCO

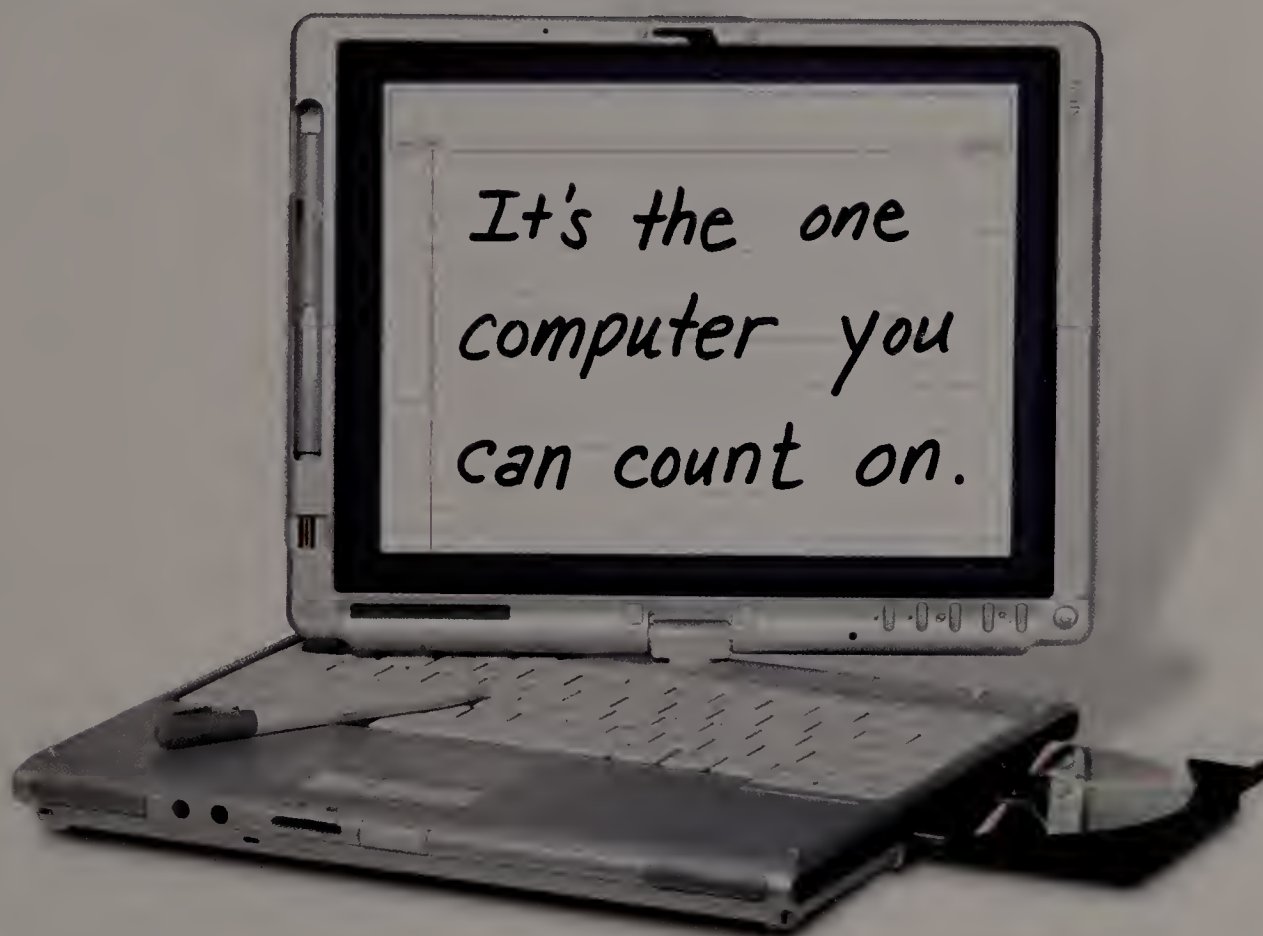
aspirations, it will need 75,000 leaders who can work effectively in global environments within the next decade. In fact, when Lenovo paid \$1.75 billion for IBM’s PC unit, it made no bones about the fact that it was paying mostly for access to Western managerial know-how and best practices.

Today, having experience in China is a bonus—often the key to landing coveted CIO positions like Bandrowczak’s. Tomorrow, it may become a necessity. China is growing more and more central to the strategies of multinational corporations, both as supplier and customer. For example, China is the United States’ second-largest supplier (after Canada) and the fourth-biggest market for

American goods, according to the U.S. Customs Service. “If you can show that you’ve taken an organization in massive growth mode in China and managed IT across those different cultures, that’s going to be worth a lot. You’re going to be able to get that big CIO job,” explains Steve Mullinjer, managing partner at executive search firm Heidrick & Struggles in Shanghai. “China is such an increasingly integral part of every company’s operations. In the future, if you don’t have firsthand experience, you’ll be in trouble.”

Don’t see yourself living in Shanghai? You’ll be dealing with Chinese IT in some form or another in the future, be it through outsourcing, working with suppliers or

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serving customers. Even if you don't spend a week every month in a Beijing hotel as does Bandrowczak, some direct knowledge of China increasingly will be critical to your career prospects.

But for all the talk about the promise of China and its growing importance to Western corporations, the IT environment there remains a challenging one. CIOs heading to China for the first time, either out of opportunity or necessity, should understand the obstacles before they go.

"Managing IT in China isn't seamless at all," says Matt Brennan, interim CIO for Asimco, a \$400 million auto parts distributor based in Beijing. "You have to be prepared for some real challenges. But it can be very satisfying if you persevere."

WHERE I.T. IS STILL A SERVICE

One of the things CIOs learn about China early on is that while youth, excellent education and enthusiasm abound, experience does not. For Charlie Peters, who has overseen IT and e-business efforts in China for 15 years as senior executive vice president for Emerson, a \$17.5 billion electronics manufacturer, that's part of the thrill. "The drive of the people is unparalleled in the business world, yet their knowledge of even basic business approaches is nonexistent," Peters says. "So it's fulfilling to teach and experience the progress they make."

To help meld local enthusiasm with global experience, Bandrowczak has created an IT management team made up of half U.S. professionals and half Chinese, which mirrors the makeup of Lenovo's executive team. The Western managers bring understanding of global and enterprise IT management principles; the Chinese managers bring knowledge of local management mores. The only problem Bandrowczak foresees is that those skills he's imparting are increasing in value in the local market. "You don't find many companies building data centers and housing all technology and enterprise services out of China right now like we're trying to do," he says. "But in the future, within the next year, we'll have a retention problem."

Outside of the technology industry, it's already difficult to find IT help, partly because Chinese companies don't often

place a high strategic value on IT. "In the U.S. it may be difficult to attract top talent to an internal IT department, but it's not impossible," says Charles Wan, who was born in Chongqing, China, but spent 15 years going to school and working in IT in the United States and became an American citizen before being tapped by Midea, a \$5 billion appliance manufacturer based in Shenzhen, as its first strategic CIO. "In China, to work for the internal IT department is considered a service job. The core business is not IT. They'd rather work for a vendor." It's not just an image thing, says Wan; the high-tech companies pay twice as much. "I was constantly telling my CFO, these people are underpaid," says Wan. "We need more money to get people here and get them motivated."

China's Perils and Opportunities

To read more of CIO's coverage of IT issues in China, see "Making It in China," www.cio.com/101505, and "It's Cheaper in China," www.cio.com/091505.

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Managing IT in China: DOs and DON'Ts

DO seek out a local lieutenant. Someone familiar with the local landscape and with connections will prove invaluable.

DON'T automate everything. Sometimes a technology solution is not appropriate, and manual processes may prove cheaper.

DO attempt to learn the language. Or, at least a few words. That shows respect.

DON'T import your management style without modification. What works in terms of motivation or communication in the United States may not go over as well in China. Keep an open mind and learn what works and abandon what doesn't.

DO get out of the office. Visit the Forbidden City. Eat in local restaurants. All work and no play makes for a dull CIO. And cultural immersion will not only benefit you personally but professionally too.

DON'T meet reluctance with force. There's nothing worse than an overbearing expat. Approach challenging situations with patience and empathy. Understand the rationale behind resistance before deciding how to overcome it.

DO make sure you have your family's support. Eighty percent of executives going to China on an assignment are accompanied by their families. Even if you're not living in China full-time, constant travel back and forth will affect your home life. If your family's not happy, you're not happy.

DON'T assume you'll have local software and IT services support. The local market is still underdeveloped. Have a plan to fill in the gaps. —S.O.

Wan succeeded in getting a bigger hiring budget from HR and finance, but not quite enough to compete with the global IT vendors like SAP and Oracle. So he changed his tactic. "I decided it was better to train new grads than to try to hire them away from other firms," says Wan. "The strategy worked, but it took time."

Don't expect outside help to fill the gap, either. China suffers from a dearth of local third-party systems implementation partners and local software companies. "If you're doing a major implementation, there's less of a resource base so your implementations are going to be more expensive and more difficult to do," says Peters, who's currently paying a premium to IBM China for its help with Emerson's ERP implementations.

THE COMPLEXITIES OF HIERARCHY

While China may seem like a new frontier to Westerners, that's not at all the way the Chinese view their business landscape. In fact, new ways of doing business threaten very old and established hierarchies. Many

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Career

leaders inside Chinese companies came aboard when their enterprises were run by the state and Communist party. These men wielded tremendous amounts of authority and power in that structure. Not surprisingly, they still want to be in charge. And, as is typical in communist bureaucracies, they are accustomed to change happening at a snail's pace. They often resist new ideas—especially when they come from outsiders.

Combating this kind of opposition was a challenge for Brennan at Asimco, which is

still partnered with, invested in and connected to various state-owned enterprises in many complex ways. Brennan sought counsel from his direct report, IT services manager Bruce Li, who is overseeing Brennan's current ERP project and serves as a cultural attaché for the interim CIO. "Bruce has fantastic English language and cultural translation skills and keeps me on the straight and narrow in terms of how I need to be perceived," says Brennan. "I have to strike a balance between being the expert

making these business units move on an issue and working collaboratively with them as a partner. I want to be authoritative and strong but I don't want to be that overbearing, know-it-all expat."

Li helped Brennan get the general managers of the company on board with both upgrading the company's existing ERP system and a more problematic new business intelligence system. "We were dealing with folks from the state-owned entity side. And even though we own a majority stake in them now, the local guys can make life difficult if you don't know how to deal with them," says Brennan. "Bruce is pretty ingrained in the corporate culture, having been here eight years. So when it came time to ask them for access to their firewalls, or to figure out how to work with their finance resources, my approach was to talk to Bruce first. I let him go deal with the local folks and call me in at the appropriate point," says Brennan.

And it worked—most of the time.

"You know very quickly whether you've grabbed the audience," Brennan says. "Either things happen very rapidly or nothing gets done at all. There's not a lot of middle ground." On one occasion, Brennan saw an implementation at a local plant grind to a halt because he hadn't spent enough time bringing plant executives on board.

Having a local second-in-command is invaluable, as Bandrowczak has also found out. His local expert in residence is actually the former CIO of Lenovo, Xiayon Wang. "She had tremendous experience and was

"In China, to work for the internal IT department is considered a service job. **The core business is not IT.** They'd rather work for a vendor."

—CHARLES WAN, FORMER CIO,
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Life in China

The career opportunities are huge. But so are the costs to your family, your health and your freedom.

As CIO of Lenovo, Steve Bandrowczak shuttles back and forth between New York and Beijing once a month. The travel is tough. "The biggest sacrifice is to your family and to yourself," he says. But that's just the cost of doing business for corporate IT executives today. "Anytime you're in a global leadership position, you're going to spend a significant amount of time traveling."

The bigger leap is moving to China for an extended period of time—or for good. Most foreign CIOs will move into an expatriate community—either apartment complexes or gated communities. "There's Starbucks, health clubs, western style shopping," says Matt Brennan, who lived in China for five months as the interim CIO for automotive parts distributor Asimco. "It's nice."

But there are challenges. Health care is not up to American standards. And those executives who bring their children will have to pay for expensive private schools, whose tuition rivals private colleges in the United States. Pollution is a problem in every large Chinese city, as is the lack of freedom to move around the country.

Yet living and working in China may be more difficult for Chinese nationals who return from the United States. When Charles Wan became CIO of Shenzhen-based appliance maker Midea, he moved his family to a large employee housing compound, where there was a garden, a pool, a restaurant and a school—"everything clean and organized," Wan explains. "But outside, it was a different world: dirty, noisy, busy

and crowded." His American-bred daughter rebelled. "This place stinks," she told Wan, and never wanted to venture outside the walls again. After several visits, his wife and daughters decided life in China just wasn't for them.

There is also widespread mistrust of Chinese who return home after years in the United States. "Even though the government wants to welcome back overseas Chinese, people inside China perceive us very differently," says Wan. Still, Wan remains captivated by China's potential. He's seeking out a patent for new technology that would serve both the Chinese and global market, and hasn't ruled out a full-time return to his native land.

—S.O.

All the traveling to China takes its toll, and "the biggest sacrifice is to your family and to yourself," says Lenovo Group CIO **Steve Bandrowczak**.

the head architect and lead change agent at Lenovo," says Bandrowczak, who divides his time in Beijing among the local IT team, the business heads and the local factories. Wang didn't have the global deployment experience to continue on in the CIO role immediately following Lenovo's acquisition of IBM's PC division but stayed on as Bandrowczak's lieutenant in Beijing. "She's been extremely valuable to me," he says.

THE FINAL FRONTIER

Besides the challenges on the ground in China, there is the challenge of time and distance for those trying to maintain a link with the United States. Wan, for example, eventually left Midea, returning to the United States because the job was putting too much stress on his family relationships (see "Life in China," this page). But not a week goes by that he doesn't hear about another CIO opportunity there. "I get calls from China all the time, asking me to come back," Wan says. "The demand for qualified IT leaders over there is only going to increase."

But the real lure of China is the unique challenge it presents to CIOs. The frontier, after all, has always called out to pioneers, promising the satisfaction and glory of triumphing over difficulties, the more exotic the better.

"Change management here in China is more complex and takes more time," says Brennan. "You'll definitely run into roadblocks. Some are political. Some are organizational. Others have to do with a lack of local vendors and consultants. It's not a good environment for someone who's easily discouraged. But if you keep at it, you'll find the positive spirit over here."

"What drives me personally is looking at where can I make my mark and leave something that's very memorable," says Bandrowczak. "If you think about the story of Lenovo, a Chinese company that's trying to compete in a global market in an industry that's very tough—and at the heart of its success or failure will be the enablement of IT—that's a story that will only be told once. And that's the job I signed up for." **CIO**

Senior Editor Stephanie Overby writes frequently about offshoring. She can be reached at soverby@cio.com.





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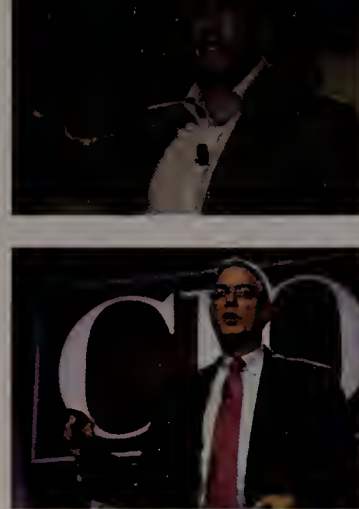
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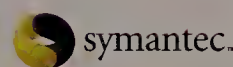


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UNSTUCK IN THE MIDDLE

Life as a small- or mid-market CIO may be one of the toughest challenges in IT. Here's how a few IT leaders in this space have persevered and even flourished.

BY MATT VILLANO

IMAGINE NEEDING TECHNOLOGY BUT NOT having the resources to spend on it. Imagine being so busy reacting to problems, you never have time to plan for the future. Imagine being so overwhelmed by new reporting regulations, you can barely get your staffers to update their passwords. Imagine trying to tackle these issues with a gaggle of outsourced workers, or a tiny, overworked and underqualified staff.

Most mid-market CIOs don't have to strain their imaginations; these are the facts of their lives. Indeed, life in the mid-market is hard. Companies with annual revenue between \$50 million and \$1 billion have the same fundamental problems as enterprises in the Fortune 1000—resources, time management, compliance and staffing—but

mid-market CIOs must address them in an entirely different manner than their wealthier counterparts. Indeed, recent data from *CIO's* "The State of the CIO 2006" survey found that technology leaders in small and midsize companies are far more hands-on than their counterparts at larger firms. At the same time, while their brethren at larger companies usually report straight to the top, IT leaders at smaller companies often report to second-tier managers, mak-

Reader ROI

- Why it's so difficult to be the CIO of a small or midsize company
- How to survive, even flourish, in this role
- The pros and cons of outsourcing



In recruiting IT staff to Cascade Designs, CIO **KEN MEIDELL** has found that hiring workers out of college and giving them perks and good benefits helps him compete with Microsoft and other local powerhouses.

ing communication even more critical.

"Mid-market CIOs are always fighting fires," says Laurie McCabe, vice president of the small and midsize business solutions group at Access Markets International Partners, a research organization in New York. "In that environment it's tough to think about the bigger picture, but the advantage they have is that if they can carve out the ability to look ahead, they can be more agile and flexible than a larger company."

As McCabe suggests, those CIOs who can deal deftly with the problems they face in the mid-market need to have something extra, a bit of wizardry. Larry Bonfante, Greg Seyk, Jim Taylor and Ken Meidell are four who lead by example, constantly innovating in a drive to compete. These technologists speak philosophically about the challenges they face, and recognize that like most small businesses, they have to work two or three times as hard as the big boys to succeed. Still, it seems none of them would have it any other way.

"Is being a CIO in the mid-market more challenging than being a CIO at a bigger firm? You bet it is," says Bonfante, CIO of the United States Tennis Association (USTA), the \$220 million organization that runs the annual U.S. Open tennis tournament. "But nowhere else can you really feel like you're making a difference every single day."

PUTTING OUT FIRES

CIOs at big companies strive to minimize costs by forecasting systems development projects so they are not caught by surprise. However, at many mid-market companies, this kind of IT planning is difficult at best because these technology leaders already have so much to worry about. CIOs who run businesses in this boat describe their leadership approach as reactive, and their strategy as one of survival.

Early in his career, when Larry Bonfante served as an IT executive at pharmaceutical firm Pfizer, he had the option of delegating problems to someone else. Now, as CIO of a small organization with limited staff, he must get personally involved with just about every operational hiccup to make sure it is solved appropriately.

A perfect example is the U.S. Open itself. The late-summer event brings in \$185 mil-

Five Tips for the Mid-Market CIO

Overseeing IT at a small or midsize business is a lot more challenging than overseeing IT at a Fortune 1,000 firm. Here are some secrets to success:

- 1. Look outside** the enterprise to outsourcing providers and vendors for help with complicated projects.
- 2. Don't be afraid** to get your feet wet and jump in to handle "emergency" situations.
- 3. Work hard** at managing up and maintaining good communications with top executives, whether or not you report to them.
- 4. Recruit and retain** staffers with an attractive mix of flexibility and independent projects.
- 5. Make a case** for IT investments based on how they will help your company comply with federal regulations such as the Sarbanes-Oxley Act.

lion in revenue, and Bonfante and his staff of eight have a budget of approximately \$6 million for the entire year, and they must use a portion of that to provide technology for the tournament. Whether it is setting up electronic scoring systems, or making sure reporters have wireless access at the tennis facility in Flushing, Queens, Bonfante and his IT team quite literally run all over New York City to make sure USTA technology is performing the way it should.

"I'm up to my ears in alligators," Bonfante

says. He describes the annual event that spans from late August to early September as an "exhilarating but exhausting" endeavor that draws hundreds of thousands of visitors. "A good thing about mid-market companies is the lack of bureaucracy, but this means that when things go wrong, you're right there in the middle of everything."

Bonfante, for example, had to get involved when his organization's Web domain expired earlier this year. The black-out occurred after the director of service delivery for USTA failed to renew the service with website registrar Network Solutions. The provider suspended service and shut down the site; only after Bonfante called Network Solutions and paid a \$45 reactivation fee was the site repopulated.

Complicating matters is the fact that USTA board members, many of whom are former tennis professionals with little IT experience, expect Bonfante to spend time with them during their board meetings during the course of the year. During these meet-and-greets, Bonfante says he must market IT to board members and the business side of the organization. He estimates that he spends a "fair" amount of his time with executives and hints that this time could be better spent in the trenches to deal with the day-to-day operations.

"There is an ongoing marketing and education effort that comes with the job, but sometimes it's heavier than others depending on the time of year," says Bonfante, who reports to the CEO. "It's making sure that people at board level understand the value of IT and that they understand how we're involved in every aspect of the business. That takes time, and there's nobody else to do it but me."

LIMITED RESOURCES

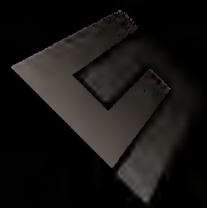
It's no secret that financial resources at small and mid-market organizations are considerably more limited than those at bigger companies. With this in mind, many mid-market CIOs have improvised to meet technology needs with the resources they have. As CIO and vice president of IT at VisionQuest, a \$70 million, Tucson, Arizona-based organization for at-risk teens, Greg Seyk manages four IT staffers for a user base of 700 (out of 1,400 total employees)

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When Bonfante worked at Pfizer, he could **delegate problems**. Now as CIO of a smaller firm, he must get involved with just about **every operational hiccup**.



and has an annual budget of \$1.2 million. Put simply, there's no way he can invest much in hardware.

His solution: leasing equipment instead of buying it. Seyk has turned to vendors such as Cisco, Dell and IBM for three- and four-year leases on equipment. All leases include maintenance contracts so VisionQuest IT isn't bogged down with troubleshooting. Seyk says this strategy provides an advantage because leased equipment provides a fixed monthly cost that is easily budgeted for by operations, with a continual hardware refresh cycle every 36 to 48 months as the leases expire.

"Our operations department perceives technology as a fixed monthly expense like any other 'utility,' rather than an asset that depreciates and must then be replaced with a new capital investment," says Seyk, who reports to his company's CFO. "It could be argued that my fixed expense changes over time, but because older technology improves as it is replaced with newer technology, our technology generally continues to support the business expansion without a commensurate incremental capital investment."

Seyk says his relationship with his vendors is critical to making ends meet. In January, when the company inked a four-month deal with IBM to install a new wide-area network (WAN), Seyk insisted that the vendor include a full-time project manager so Seyk would not have to hire a new employee to manage the deal or train one of his current employees to do it. The results of this negotiation were savings of at least \$75,000—what it would have cost to hire for one full-time spot. (Once the WAN is installed, VisionQuest will maintain it.)

Seyk says he plans to apply the same

Larry Bonfante, CIO of the United States Tennis Association



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strategy during a forthcoming upgrade from Lawson Software version 7.22 to Lawson Software version 8.03. This time, instead of negotiating a project manager from Lawson directly, Seyk outsourced the deal to Salient, a provider that specializes in these types of implementations, and convinced the firm to “throw in” a full-time human liaison to see the job through until completion in January 2007.

“In theory, [this person] will keep our project moving from a company perspective and will work with the individuals who are responsible for each particular area,” says Seyk, who adds that overall, the project will cost about \$600,000. “He will be responsible for keeping the project headed in the right direction.”

COMPLIANCE WOES

CIOs at nonprofit organizations such as USTA and VisionQuest don't have to worry too much about stringent new federal reporting requirements. For CIOs at mid-market firms that are publicly traded, however, legislation such as the Sarbanes-Oxley Act (Sox), the Gramm-Leach-Bliley Act and the Health Insurance Portability and Accountability Act exact a particularly heavy toll.

These laws require companies to focus on reporting, hiring audit firms to make sure information is accurate, and installing complicated IT infrastructures that prove financial and private customer information is secure. The problem, of course, is that mid-market companies simply don't have the financial or human resources to perform these tasks, making an already tenuous situation even more tense for everyone from programmers to the CIO.

Jim Taylor, corporate IT manager at Westmoreland Coal, a \$333 million company in Colorado Springs, Colo., says that before Sox became law in 2003, his department had no formal auditing processes in place at all. In July of 2003, the department issued 11 policies for adoption that spell out how the organization will tackle everything from disaster recovery to technology refresh.

Many of these policies are derived from the Cobit framework, an open standard for control over information technology, developed and promoted by the IT Governance

Institute in Rolling Meadows, Ill. Still, the policies themselves aren't what costs money; according to Taylor, “it's the technology that drives them that costs a ton.” For West-

A Little Help from Your Friends

When you're the CIO for a small or mid-market company, outsourcing makes sense—unless, of course, IT innovation is a competitive differentiator for your company

WHEN MID-MARKET CIOs

can't find or keep staffers to tackle certain tasks, many farm out the jobs to ease the burden on their already overworked staff. The upside to outsourcing undoubtedly is the ability to add capabilities that are beyond your staff and resources. The downside is that outsourced technologies aren't yours to keep and innovate with.

At Jacob Stern & Sons, a \$300 million fragrance chemical maker, Director of IT Dale Polekoff outsources complicated programming jobs such as business intelligence because he says it's easier to shift responsibility for specific technologies to outside specialists than to teach one of his three frantic staffers new tricks. Even so, Polekoff says he spends “far too much time” getting some of his third-party service providers to understand what the company's needs are, and how those needs fluctuate depending on the vagaries of the chemical market.

“Third parties change staff all the time, and as a mid-market company, we sometimes find ourselves reinventing the wheel for them,” says Polekoff. Still, he notes, the benefits far outweigh these burdens.

To avoid communication mix-ups, some mid-market CIOs build long-standing outsourcing agreements around external partners who have performed successfully in the past. For example, at the American Diabetes Association (a \$210 million nonprofit), Frank Hoose, senior VP of

information technology and administration, farms out Oracle scripting to the same few solution providers, some of which the firm has worked with for years. Because Hoose doesn't have programmers on staff, he says that turning to these “trusted” partners just makes sense.

CIO Mykolas Rambus does the same thing at W.P. Carey, a \$218 million investment firm focused on corporate real estate finance. Rambus, who reports to the IS steering committee, has so much success with a local house of developers that he sends all of his development projects their way. It's not that Rambus doesn't have the skills on his IT staff to get programs written; on the contrary, he says he employs some pretty talented people. Still, with so much to do and so little time to do it, Rambus says he'd rather have his staffers focused on bigger things such as leveraging CRM systems.

Under an outsourcing arrangement, CIOs can still innovate as they would if they were doing things on their own, Rambus and others say. They can send out an RFP for work on new technology, or ask a trusted partner to learn a new skill. The only downside? In-house programmers aren't learning new technology.

“Our value is interfacing with business units, not in programming,” he says. “At the end of the day, we don't want to be a bottleneck to a business process because our best people are off writing code.” —M.V.

moreland, that “ton” has totaled \$1.5 million so far, including fees to auditing firm KPMG. There's a silver lining here, however: Taylor says that the law has finally

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The promise of hands-on work with all of the **latest technologies** can make a smaller company stand out from the crowd in **attracting good talent**.

given him leverage to implement some of the applications he has wanted all along.

Case in point: the company now has a new Denver data center to run a JD Edwards Enterprise One, which coordinates payroll and finance systems that previously had been implemented at a number of remote sites. Taylor, who reports to the vice president of administration, invested in this data center last year to centralize new systems designed to comply with Sox. Today, the new facility also houses a storage area network and document management system and will soon house the company's primary e-mail exchange server. All of these technologies were bought and implemented with regulatory compliance in mind.

To set up this data center, Taylor called upon the services of Dimension Technology Systems. Though nobody from the company possessed a Statement on Auditing Standards (SAS) certification originally developed by the American Institute of Certified Public Accountants, Taylor convinced the firm to send its consultants to school for this knowledge so they could deliver the kind of compliance Westmoreland required.

"It is a major expense for our solution provider," Taylor says of the SAS 70 class. "They are committing to it because they realize that in the compliance-driven marketplace of today, if they don't do it, they'll be left out of opportunities in every market." (For more on the pros and cons of outsourcing, read "A Little Help from Your Friends" on Page 90.)

STAFFING STRUGGLES

Attracting and keeping good talent is an important issue for all CIOs, but it is particularly challenging for those in the mid-market, according to "The State of the CIO 2006" survey. Larger companies with bigger budgets simply can pay more. And because so many mid-market IT staffs are understaffed and overworked, the burnout

rate is high, with some companies losing talented workers in droves to larger and wealthier companies.

At Cascade Designs, an outdoor equipment manufacturer in Seattle that earned somewhere around \$75 million last year, CIO Ken Meidell has learned how to adapt to this challenge. After years of losing out to powerhouses such as Boeing, Microsoft and Real Networks in his search for experienced programmers, Meidell finally hit on the strategy of hiring staff members straight out of college and appealing to them with inducements they like: flexibility, individual freedom and, of course, camping gear. So far, the strategy has worked wonders.

To do this, Meidell contacts recruitment offices of local colleges and schedules interviews with computer science and engineering graduates who want jobs in and around the Seattle area. Sure, the big guns recruit in this manner as well, but Meidell says the promise of hands-on work with all of the latest technologies make Cascade stand out from a crowd of companies that can't promise more than a desk in a cube farm. Over the past few years, the company has hired employees straight from IT programs at the University of Washington, North Seattle Community College and Washington State University. All of these employees are still around.

"There's nothing wrong with homegrown talent, especially when you get them while they're young," says Meidell, who reports to the company CEO. "We plug them in on the help desk, then after a year or so, they have a good idea of what they're interested in and we try to accommodate that."

Once Meidell hires these young guns, he does his best to keep them. At Cascade, this

doesn't necessarily mean huge monetary incentives; instead, retention revolves around flexibility. So long as they spend a few days in the office, employees are encouraged to telecommute from home. Once employees prove they are reliable, Meidell also grants them flexibility in choosing their projects. If, for instance, a programmer is interested in Linux, Meidell will throw the bulk of the company's open-source work his way.

Another benefit of working at Cascade, of course, is the gear. The company makes sleeping bags, tents, snowshoes, backpacking stoves and other grown-up toys for those who love the outdoors. While employees are not entitled to these products for free, workers can purchase them at significantly discounted rates, a real treat for the crowd in the Pacific Northwest. "People on our IT staff get to wear shorts and Chaco sandals to work in the summer," Meidell says. "Even after the dotcom experience, I'm not sure everyone gets to do that at bigger companies these days, and that makes us different."

Indeed, reality for technology leaders at mid-market companies is nothing if not different. Whether battling challenges in staffing, compliance, funding or time management, CIOs in this space face a constant battle to make the most of the resources they have and still turn a profit. Most of the time, this is a truly daunting task. Still, championing IT at a smaller organization can be exhilarating and, as any one of these four men can attest, totally fulfilling.

"Running technology at a company the size of mine is exciting, exhausting and just about everything in between, but at the end of every day, I think to myself that even at some of the biggest companies in the world, there's no better job on Earth," Meidell says. **CIO**

"The State of the CIO 2006"

To read highlights from the latest "THE STATE OF THE CIO" survey, including mid-market data, go to www.cio.com/state. **CIO.COM**

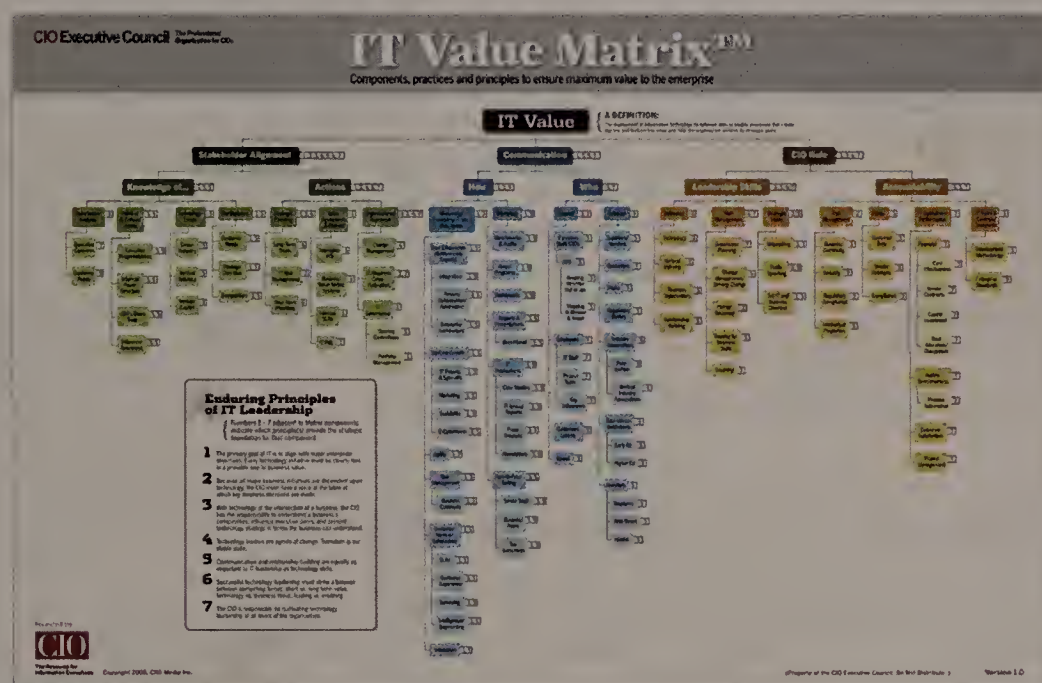
Matt Villano is a freelance writer and editor based in Half Moon Bay, Calif.

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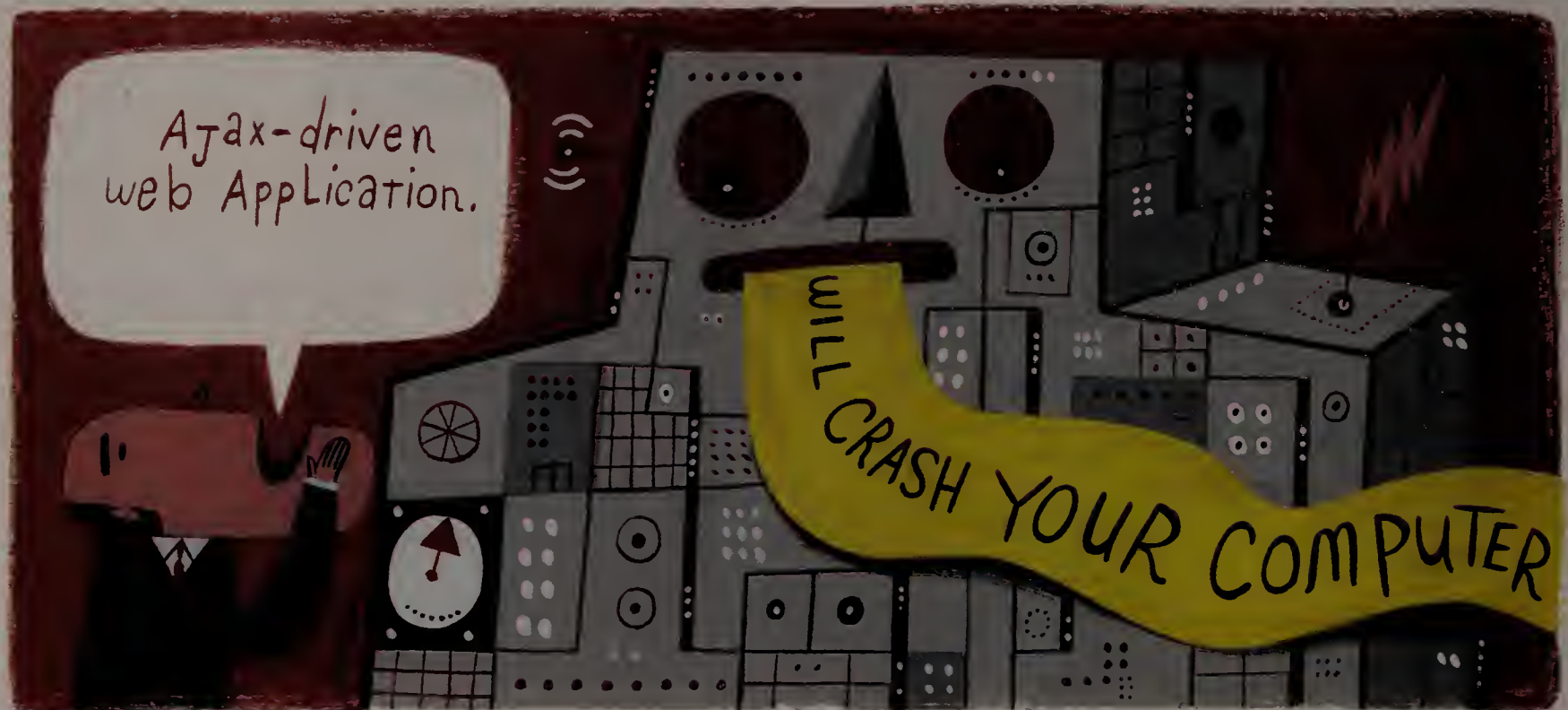


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